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ENTRIES 5284–6131

M. L. Dorsey.

BOTANICAL ABSTRACTS

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Vol. 12 OCTOBER, 1923 No. 8

ENTRIES 5283–6131

AGRONOMY

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(See also in this issue Entries 5390, 5394, 5395, 5410, 5458, 5464, 5504, 5558, 5621, 5628, 5817, 5873, 5921, 5935, 5938, 5982, 5995, 5996, 6006, 6008, 6010, 6011, 6012, 6013, 6015, 6016, 6018, 6019, 6020, 6021, 6022, 6025, 6026, 6028, 6030, 6031, 6124)

5284. Anonymous. **College Algerians: A new strain of oats.** New Zealand Jour. Agric. **26**: 147–148. 1923.—This is an unusually high yielding strain of oats.—*N. J. Giddings.*

5285. Anonymous. **Ensilaje de alfalfa.** [Alfalfa silage.] Rev. Soc. Rural Córdoba [Argentina] **21**: 6027–6030. 1922.—Directions are given for making silage from alfalfa under conditions prevailing in Argentina.—*John A. Stevenson.*

5286. Anonymous. **Flax cultivation in Victoria.** Jour. Dept. Agric. Victoria **19**: 108. 1921.—The area sown with flax in Victoria increased from 400 acres in 1917 to about 2,000 acres in 1920. To stimulate the grower's interest in the production of flax the Commonwealth Government made a guarantee and offered a dividend over and above the cost of milling and administrative expenses. Brief notes on cultural practices are given.—*Mary R. Burr.*

5287. Anonymous. **Oversigt over Statens Forsög i Plantekultur i Fanansaaret 1923–1924. [Plans for the State Agricultural Experiment Stations for the fiscal year 1923–1924.]** Tidsskr. Planteavl **29**: 143–159. 1923.

5288. Anonymous. [Rev. of: McCall, J. S. **A handbook on cotton and tobacco cultivation in Nyasaland: a guide to prospective settlers.** *85 p.* Government Printer: Zomba, Nyasaland, 1920 (see Bot. Absts. 12, Entry 5354).] Nature **109**: 337–338. 1922.

5289. Arbuckle, H. B., and O. J. Thies, Jr. **Variation of protein content of corn.** Jour. Elisha Mitchell Sci. Soc. **38**: 84–87. 1922.—Grain resulting from West Virginia-grown seed planted at Davidson, North Carolina, showed a marked reduction in protein. A modification of the Kjeldahl method was employed in determining the nitrogen content. There is about 1 month's difference in season between the 2 localities.—*W. C. Coker.*

5290. Bailey, L. H. (Editor.) **Cyclopaedia of farm crops: a popular survey of crops and crop-making methods in the United States and Canada.** *669 p., 25 pl. 907 fig.* The Macmillan Co.: New York and London, 1922.—Part I, of 7 chapters, covers structures and physiology, insects and diseases, breeding, plant introduction, crop management and weeds, growing under cover, seeding, planting and yields. Part II, of 2 chapters, covers preserved products, juices, and liquors. Part III covers North American field crops. Each chapter is subdivided into several parts and each is treated by a well known specialist. [See also Bot. Absts. 12, Entry 5360.]—*P. L. Ricker.*

5291. Barker, Eugene E. **Como seleccionar y cuidar la semilla de maiz para la proxima siembra.** [Selection and care of seed corn for the next crop.] Rev. Agric. Puerto Rico 6[1]: 9–19. *6 fig.* 1921.—Methods of selecting and storing seed corn under Porto Rican conditions, so as to improve the crop in yield and quality, are discussed.—*John A. Stevenson.*

5292. Bartlett, H. **Farmers' experiment plots. Winter green fodder experiments, 1922. Western district.** Agric. Gaz. New South Wales 34: 251–254. 1923.—Due to the increase of certain wheat diseases crop rotation to include forage crops has become of increasing importance. Experiments undertaken cooperatively with 8 farmers in the production of forage crops, are described. Production is given in amounts of stock carried.—*L. R. Waldron.*

5293. Beauverie, J. **Influence de la hauteur d'eau météorique pendant que la "période critique" du blé sur le rendement.** [The influence of the amount of rainfall during the "critical period" on the yield of wheat.] Compt. Rend. Acad. Sci. Paris 176: 707–709. 1923. —Azzi has called the stage of development during which the plant most needs water, the "critical period." For wheat this has been found to be the 30 days preceding and during the time of heading. A comparison has been made of the yield of wheat in the Department of Puy-de-Dôme for 21 years, 1901–1922, and the rainfall records for this region. The 2 graphs are shown and their rather close correspondence discussed. The rainfall varied from 70 to 160 mm.—*C. H. Farr.*

5294. Berkner. **Der Einfluss der Jahreswitterung auf Höhe und Güte der Erträge unserer Feldfrüchte.** [The influence of the annual weather conditions on the size and quality of the yield of our field crops.] Illus. Landw. Zeitg. 42: 267–269, 276–277. 1922.—The effect of weather conditions on the yield and quality of the various crops, including optimum weather conditions for high yield and high quality, are discussed. It is maintained that by the selection of varieties adapted to local conditions of soil and climate, yields can be greatly increased both in size and in quality.—*John W. Roberts.*

5295. Blakely, W. F. **Weeds of New South Wales.** Agric. Gaz. New South Wales 34: 286–291. *3 fig.* 1923.—*Euphorbia prostrata, E. thymifolia,* and *E. Preslii,* weeds introduced into Australia, are figured and described and methods of eradication are discussed.—*L. R. Waldron.*

5296. Blakely, W. F. **Weeds of New South Wales.** Agric. Gaz. New South Wales 34: 332–336. *2 fig.* 1923.—Blessed thistle (*Cnicus benedictus*) and small-fruited devil's claw (*Martynia diandra*) are figured and described and methods of eradication and control are discussed. Neither plant is at all common.—*L. R. Waldron.*

5297. Brambila, Alejandro. **Establecimiento de semilleros de tabaco en terrenos esterilizados.** [Establishment of tobacco seed beds in sterilized soils.] Rev. Agric. [Mexico] 7: 305 307. *7 fig.* 1922.—Methods of sterilizing tobacco seed beds with steam in order to prevent damping off are described.—*John A. Stevenson.*

5298. Brune, F. **Ueber vergleichende Kartoffelsortenversuche auf verschiedenen Bodenarten in den Jahren 1920 und 1921.** [Comparative experiments with potato varieties on different soil types.] Illus. Landw. Zeitg. 42: 259–260. 1922.—The experiments were con-

ducted with 26 potato varieties on high moor, low moor, sand, and marsh soils. The results show yield of tubers, comparative rating of the varieties based on the yield, and also the starch content of each variety.—*J. C. Dunegan.*

5299. Cabrera, Pablo Morales. **Henequen y piño. [Henequen and pineapple.]** Rev. Agric. Puerto Rico 9^2: 39–42. 1922.—The author gives a brief account of the uses and methods of preparing the fibers of *Agave* and of *Ananas*. The possibilities of growing the 2 plants for their fiber in Porto Rico are discussed.—*John A. Stevenson.*

5300. Calvino, Mario. **La caña Uba del Natal. [The Uba cane of Natal.]** Rev. Agric. Puerto Rico 7^1: 17–26. 1921.—The results of chemical tests of the sugar cane variety Uba or Kavangire at the Cuban experiment station in comparison with other standard varieties are given.—*John A. Stevenson.*

5301. Cauthen, E. F., and J. T. Williamson. **Time of applying nitrate of soda to corn.** Alabama Agric. Exp. Sta. Bull. 210. *17–32.* 1920.—Before the advent of the boll weevil, 100 pounds of nitrate of soda per acre to corn plants 2½ feet high gave an average increase of 7.5 bushels. When in addition an equal amount was added just before time to tassel, there was an increased production, and a still greater one when 240 pounds were applied.—More recent experiments indicate that 100 pounds of nitrate of soda when corn plants are 2½ feet high give the greatest increase of seed corn per acre.—*Wright A. Gardner.*

5302. Chardón, Carlos E. **El "Coque." [Nutgrass.]** Rev. Agric. Puerto Rico 9^2: *45–46. 2 fig.* 1922.—A description is given of the plant known as coqui or nutgrass (*Cyperus rotundus*), widely distributed as a weed in Porto Rico, particularly in sugar cane fields where it harbors a new species of leafhopper (*Carolinia*) recently demonstrated to be a carrier of the mosaic disease.—*John A. Stevenson.*

5303. Christiansen. Edv. **Dyrkningsforsög med Sorter og Stammer af Haveguleródder og Rödbeder. 1919–1921. [Experiments with varieties of garden carrots and beets 1919-1921.]** Tidsskr. Planteavl 29: 117–142. 1923.—This is a report of government experiment station results.—*Albert A. Hansen.*

5304. Colon, E. D. **Trabajos de investigacion durante el año fiscal de 1919–1920. [Investigational work during the fiscal year 1919–20.]** Rev. Agric. Puerto Rico 6^3: 7–14. 1921.—The director reviews the work of the Insular Experiment Station. Particular attention was given to sugar cane varieties in connection with studies of the mosaic disease. A start was made in the improvement of rice, corn, and tobacco varieties. Fertilizer tests with pineapples were carried on.—*John A. Stevenson.*

5305. Cross, W. E. **Ensayos de cultivo de caña con caupi en las trochas. [Experiments in cane cultivation with cowpeas interplanted.]** Rev. Indust. y Agric. Tucuman 12: 99–102. *1 fig.* 1922.—Experiments have been carried on for 4 years to test the effect of interplanting legumes (cowpeas) on yield of sugar, using the variety P.O.J. 213. The cowpeas were planted as soon as moisture conditions permitted after the ratooning cane had been cultivated for the first time. Check plots adjoined those in which the cowpeas were planted. The results indicated that not only was there no increase in the legume plots but that there was a decrease in yields as compared with the check plots, with evidence of actual injury to the cane.—*John A. Stevenson.*

5306. Cross, W. E. **Ensayos sobre el cultivo de la caña sin quemar la maloja. [Experiments in cane cultivation without burning the trash.]** Rev. Indust. y Agric. Tucuman 12: 103–110. 1922.—It is customary in Tucuman to burn the trash after cutting the cane crop, while in some other cane growing countries it is left on the field. There are reasons to support both methods. Burning the trash makes cultivation easier and is said to cause the cane to

germinate more rapidly for the ratoon crops. Burning may also destroy fungi and insects. In Louisiana it prevents deterioration of the cane over winter. On the other hand the trash has a high fertilizing value if left on the ground and helps to hold moisture. Experimental work on this problem was started in 1916 using the variety P.O.J. 213. In one plot the trash was burned and in another dragged into the alternate rows. It was found that the idea that cane starts to germinate more quickly when the trash is burned is true only when the trash is left lying on the cane itself. The burned over plot yielded at the rate of 4,060 kgm. of sugar per hectare, the unburned plot 4,115 kgm. The yields in the one experiment were therefore practically the same but observations and tests demonstrated that the soil had been benefited greatly by non-burning of trash, a condition that would become evident with succeeding crops. —*John A. Stevenson.*

5307. Cross, W. E. **Ensayos sobre métodos de plantar la caña. I. Método Reynosa. [Experiments in cane-planting methods. I. The Reynosa method.]** Rev. Indust. y Agric. Tucuman **12:** 65–70. *1 fig.* 1921.—A uniform plot was divided into 2 parts, 1 being planted to sugar cane by the Reynosa method, the other by the ordinary Tucuman furrow system. The Reynosa system used in Java consists of wide furrows (50–60 cm.) in which 2 lines of cane cuttings are planted, 1 on each side. The 2 plots were given uniform cultivation throughout 3 seasons. At cutting time each year the weight of cane produced was taken and determinations of sucrose and purity were made. The yields per hectare both in cane and on the basis of sugar content were practically the same from the 2 plots. If, however, the crop is sold on the furrow basis, the practice in Tucuman, the Reynosa system gives the largest returns to the grower.—*John A. Stevenson.*

5308. Cross, W. E. **Ensayos sobre métodos de plantar la caña. II Método de plantar en hoyos. [Experiments in methods of cane planting. The method of planting in holes.]** Rev. Indust. y Agric. Tucuman **12:** 93–98. *2 fig.* 1922.—The hole-method of planting sugar cane, in use in Barbados, Porto Rico, Mauritius, and other cane growing countries, was tested in Tucuman in comparison with the furrow system commonly used. The holes were made square 35 cm. across and 1.7 m. from center to center. The furrows were 1.8 m. apart, the distance usually employed. The variety P.O.J. 36 was used in planting both plots, 3 cuttings being placed in each hole. The usual cultivation for each type of planting was given throughout the season. The plot planted by the hole-method yielded at the rate of 2,248 kgm. of sugar per hectare, the furrow plot at the rate of 5,614 kgm. The 1st ratoon crop gave 6,294 kgm. for the hole plot and 5,804 for the furrow plot. The 2nd ratoon crop yielded 4,490 kgm. for the former and 3,996 kgm. for the latter, or 492 kgm. of sugar in favor of the hole-method of planting taking the totals for 3 years. These results are not considered conclusive and the experiment is being continued.—*John A. Stevenson.*

5309. Cross, W. E. **Estudios con variedades de cañas importadas. [Studies with imported cane varieties.]** Rev. Indust. y Agric. Tucuman **12:** 72–92. *6 fig.* 1921.—Besides studies of Tucuman seedlings, experimental work has been carried on with many imported cane varieties, some of which are of promise under Tucuman conditions. P.O.J. 105 (Egyptian amber) has been grown experimentally for 3 years and found to be a high yielder but with little resistance to freezing. Tabular comparison is made between it and other varieties grown on a field scale as to sucrose, glucose, and purity of the juice. D1135, highly thought of in Queensland and Hawaii, has been of sufficient promise to warrant extended tests over 3 seasons. Yon Tan San of several Japanese varieties tested, was resistant to disease and freezing but was low in sugar content. Rose Bamboo proved to be the same as the Criolla or native white cane, which has no resistance to freezing or disease. A number of other varieties from Brazil, Barbados, and Peru and some of unknown origin were also grown in the experimental plots, and several were of sufficient promise to warrant further trials.—*John A. Stevenson.*

5310. Cross, W. E. **Frecuencia de cortar las cañas forrajeras. [Frequency of cutting forage canes.]** Rev. Indust. y Agric. Tucuman **12:** 70–72. 1921.—The variety Kavangire, grown because immune to mosaic disease, has proved satisfactory for forage but not for sugar.

The question arose as to whether it could be cut more often than once a year without causing the stools to deteriorate or lowering the total annual yield. Three year's tests have demonstrated that while total yield is somewhat reduced by more frequent cuttings, the reduction is negligible. There was no diminution of vigor in the stools of cane cut twice a year.—*John A. Stevenson.*

5311. Cross, W. E. **Las cañas tucumanas en la cosecha del año 1921. [The 1921 harvest of Tucuman canes.]** Rev. Indust. y Agric. Tucuman **12**: 58–62. 1921.—This is a progress report of the work at the Tucuman station with seedling sugar canes. Observations on the resistance of seedlings to freezing were made, and comparative chemical tests, including Brix, sucrose, glucose, and purity, obtained both before and after the freezing weather. The 1918 seedlings were grown as 2nd ratoons and those of 1919 as 1st ratoons. New plantings were also made and the resulting cane tested in the usual manner. Results are given in tabular form. —*John A. Stevenson.*

5312. Cross, W. E. **Los ensayos con abonos para la caña de azucar. [Fertilizer experiments with sugar cane.]** Rev. Indust. y Agric. Tucuman **12**: 45–57. 1921.—Fertilizer experiments have been conducted at the Tucuman station for over 11 years. During 1911–14 native varieties were employed and the results were so contradictory as to be valueless, due, it is now known, to the mosaic disease, which forced the practical abandonment of the native types in favor of the Javan canes. Experiments in 1916–18 indicated that phosphates and potash did not increase yields under Tucuman conditions. Manure tests started in previous years with Zwinga and native varieties gave increased yields for the former, while mosaic vitiated results with the latter. Ammonium sulphate was applied to 4 plots, 2 limed and 2 unlimed. The variety P.O.J. 36 gave increased yields but with a lower sugar content—a gain for the Colonas since they sell cane by weight, P.O.J. 213, also commonly grown, gave results tending in the same direction but less definite. On the whole, the author concludes, fertilizing is of doubtful value.—*John A. Stevenson.*

5313. Dechampagne, A. **Profondeur du sol pour blé. [Depth of soil for wheat.]** Nat. Canadien **49**: 55–57. 1922.—In an old number of Pèlerin, Paris, it is recorded that roots of wheat will descend 50 cm. into proper soil. By the breaking up of sub-soils production over extensive regions has been increased.—*A. H. MacKay.*

5314. Derlitzki und Weber. **Mitteilungen aus dem Forschungsinstitut für Landarbeit Pommriss (Sachsen). [Communications from the research institute for farm labor, Pommriss (Saxony.)]** Illus. Landw. Zeitg. **42**: 235. 1922.—On the basis of experiments it is recommended that in soils which have a tendency to form a crust and to dry out quickly, seed should be planted 2½ cm. deep rather than nearer the surface. In the absence of rain, seed planted at this depth germinates quickly and the young plants are soon visible. If rain follows the seeding, the resulting crust can be broken by harrowing, thus permitting the young plants to appear above the surface.—*John W. Roberts.*

5315. Easterby, H. T. **Bureau of sugar experiment stations. Annual report of the directors. III Extract.** Australian Sugar Jour. **15**: 89–93. 1923.—The work at the Bundaberg station is detailed. Fertilizers, methods of culture, and the use of first, second and third ratoon cane for plants were tested. The third ratoons produced good cane crops.—*C. Rumbold.*

5316. Fawcett, G. L. **Description de dos interesantes variedades de caña. [Description of 2 interesting cane varieties.]** Rev. Indust. y Agric. Tucuman **12**: 156–160. *2 fig.* 1922.—Technical descriptions are given of 2 varieties: P.O.J. 2727, a seedling recently introduced from Java and proving satisfactory under Tucuman conditions; and Chola, a soft native variety with high sugar content which has been grown only in gardens or small native plantings—it cannot be considered for use on plantation scale because of its non-resistance to mosaic and other diseases.—*John A. Stevenson.*

5317. Fawcett, G. L. **El efecto de las heladas sobre las yemas de la caña. [Effect of freezes on buds of cane.]** Rev. Indust. y Agric. Tucuman **12**: 32–39. 1921.—Freezing weather blackens sugar cane buds. If the temperatures are not too low, varying numbers of frozen buds will sprout. Experiments were conducted with the varieties P.O.J. 36, P.O.J. 213, D1135, and Kavangire planted at various intervals after the freezing weather. The 1st and last gave 50–75 per cent germination when planted immediately, but only 2–14 per cent when planted a month later. The other varieties failed entirely. Buds on the lower parts of the stalks proved more resistant to freezing than those higher up and were found to have a lower water content.—*John A. Stevenson.*

5318. Fawcett, G. L. **Notas sobre la clasificación de la caña morada criolla. [Notes on the classification of the native Morada cane.]** Rev. Indust. y Agric. Tucuman **12**: 125–127. *1 fig.* 1922.—The author states that the native Morada cane of Tucuman is the same as the variety Bandjermazim hitam of Java and not Black Cheribon as claimed by Jeswiet. Variations in the bud characters of the 2 varieties are presented in support of this statement. The native striped cane (Rayada) is a mutation from the Morada and is the same as the Striped Preanger of Java. The white variation known as White Cristalina or Rose Bamboo is the same as the White Preanger of Java.—*John A. Stevenson.*

5319. Fingerling. **Die Gewinnung von Eiweiss im Inlande. [Domestic production of protein.]** Mitteil. Deutsch. Landw. Ges. **38**: 362–366. 1923.—In an address before the German Agricultural Society the speaker emphasized the possibility of increasing grass yields and also the percentage of protein by heavy applications of nitrogenous fertilizers and cutting the grass while very young. He had been able to increase the percentage of protein from 12 per cent in common meadow hay to 20 or 23 per cent. In order to save and utilize this high grade young grass the use of electrically equipped silos is advocated.—*A. J. Pieters.*

5320. Fruwirth, C. **Die Saatenanerkennung. [Seed certifying.]** *2nd ed., 152 p., 79 illus.* Paul Parey: Berlin, 1922.—Part I is a general discussion and concerns: purpose and development of seed certifying; steps involved in, and leading to, certification; inspection requirements (general, in the field, determining the ancestry, in the harvesting and farm storage, in the warehouse); time for inspection; plot tests; seed certifying and strain certifying; conditional or unconditional certifying; inspector's equipment and qualifications.—Part II discusses the following crops with general remarks concerning the special problems, foreign field and weed seeds present, and diseases: winter wheat; winter rye; summer barley; summer oats; corn; upright legumes; procumbent legumes; potato; beet; turnip; carrot; cabbage; rape; poppy; flax; red clover; white clover; alfalfa; esparsette; grasses; miscellaneous vegetables (cucumber, melons, tomato, radish, celery, onion, etc.); orchard and forest trees; and vines.—*W. B. Lydenberg.*

5321. Geerts, J. M. **De factoren die het product bepalen. Zesde bydrage: Het product van E. K. 28. [The factors which determine the yield. Sixth contribution. The yield of E. K. 28.]** Mededeel. Proefsta. Java Suikerindust. **1922**: 351–389. 1922.—Sugar cane variety E. K. 28 has come into general cultivation only since 1916–1917. It has been shown to be superior in most cases to 100 P.O.J. It must be planted quite early. It yields better and lodges less on old than on new soils, and is drought resistant.—Many tables are given regarding growth and field and weather conditions influencing yields. The results from different plantations are discussed separately.—*Peter J. Klaphaak.*

5322. Geerts, J. M. **De factoren die het product bepalen. Zevende bydrage: Het product van 90 F. [The factors which determine the yield. Seventh contribution: The product of 90 F.]** Mededeel. Proefsta. Java Suikerindust. **1922**: 465–485. 1922.—The new sugarcane variety, 90 F., at first very promising, is planted less and less because of its susceptibility to lodging. Under favorable conditions it produces well but lodges badly resulting in a decreased sugar content. The product is strongly influenced by the amount of lodging. The

variety is but little resistant to drought, much more sensitive than E. K. 2, E. K. 28, 247 B. It stools abundantly and has therefore been planted recently mainly on poor soils, where it lodges very little and gives a comparatively good product.—*Peter J. Klaphaak.*

5323. Geerts, J. M. **De factoren die het product bepalen. Achtste bydrage: Het product van Tjepiring 24. Negende bydrage: De varieteiten onderling vergeleken. [The factors which determine the yield. Eighth contribution: The product of Tjepiring 24. Ninth contribution: The varieties compared with one another.]** Mededeel. Proefsta. Java Suikerindust. **1922:** 487–531. 1922.—The sugar cane named Tjepiring 24 is very successful locally, especially in East Java (Sidoardjo). The leaves are stiff, the variety showing external signs of drought damage much later than others. Growing slowly it lodges but little on rich soils, where other varieties lodge severely. It has a long growing period and produces a good yield of sugar. Immunity to sereh and mosaic are advantages over susceptible varieties. In the 9th contribution varieties discussed in former articles are compared, the following being mentioned: 100 P.O.J., 247 B., E.K. 2, D.I. 52, Tjepiring 24, 2714 P.O.J., 2725 P.O.J., 1499 P.O.J., E.K. 28. Tables compare varieties under different conditions of weather, soil, yields, etc. 100 P.O.J. is generally replaced by E.K. 28 on the drier soils and by D.I. 52 on the moist soils. 247 B. is mainly replaced by Tjepiring 24 on rich soils (moist soils), but also by D.I. 52, E.K. 28, E.K. 2, and during recent years by 2714 P.O.J. Newer varieties have been gaining in popularity.—*Peter J. Klaphaak.*

5324. Girola, Carlos D. **Abrojo grande. [Giant cocklebur.]** Bol. Ministerio Agric. Nacion [Argentina] **15:** *1 col. pl. between pages 168–169.* 1920.—The botanical characteristics, injury caused, and control of *Xanthium strumarium* are given.—*John A. Stevenson.*

5325. Girola, Carlos D. **Destrucción de las plantas invasoras perjudiciales, vivaces y anuales. [The destruction of annual and perennial injurious plants.]** Bol. Ministerio Agric. Nacion [Argentina] **25:** 165–169. 1920.—Methods for controlling or destroying weeds are given.—*John A. Stevenson.*

5326. Girola, Carlos D. **El cultivo de la avena en la Republica Argentina y el concurso de avenas de 1920–1921 organizado por el Museo Agricola de la Sociedad Rural de Argentina. [Cultivation of oats in Argentina and the 1920–21 oats "show" organized by the Agricultural Museum of the Rural Society of Argentina.]** Bol. Ministerio Agric. Nacion [Argentina] **27:** 262–273. *4 fig.* 1922.—Oats are extensively grown in Argentina, either for export or for green feed, 1,295,000 hectares having been planted in 1917–18, for the most part in Buenos Aires and neighboring provinces. Very little has been done to improve the varieties used; in fact, improved imported varieties have become mixed within a few years with the native types and so lost. The average yield is 1,000 kgm. per hectare.—*John A. Stevenson.*

5327. Girola, Carlos D. **Ray-grass oriolla. [Native ray grass.]** Bol. Ministerio Agric. Nacion [Argentina] **26:** 488–489. *1 col. pl.* 1921.—The botanical characters, uses, and cultivation of *Lolium brasilianum* Nees are given.—*John A. Stevenson.*

5328. Girola, Carlos D. **Sorgho de Alepo. [Johnson grass.]** Bol. Ministerio Agric. Nacion [Argentina] **27:** 232–235. *1 col. pl.* 1922.—The manner of spread of this serious weed pest is discussed and control measures are outlined.—*John A. Stevenson.*

5329. Granel, Joaquin. **Cultivo del centeno. [Rye cultivation.]** Rev. Soc. Rural Córdoba [Argentina] **21:** 6214–6225. 1922.—Popular.—*John A. Stevenson.*

5330. Guardiola, Jorge. **Cultivo del ajonjoli. [Sesame culture.]** Rev. Agric. [Mexico] **7:** 327–332. *2 fig.* 1922.—The author recommends increased plantings of *Sesamum indicum* in Mexico. Cultural directions are given, including varietal descriptions, preparation of land, seeding, cultivation, harvesting, and yields to be expected.—*John A. Stevenson.*

5331. Hansen, Josef. **Forsog med Afvanding, Mergling of Kalkning, Jordlaegning og Godskning paa Hojmose ved Askov.** [Experiments with the application of marl, lime, liquid manure and other manures on peat soils at Askov.] Tidsskr. Planteavl 29: 1–26. 1923.—Experiments are reported with virgin peat soils about 15 feet deep. In open ditch experiments the yield of cereals and legumes was best with a distance of 11.3 m. between ditches and least when the ditches were 22.6 m. apart. The yield of grass crops for hay was best when the ditches were 22.6 m. apart and about 20 per cent less when ditches were 5.7 m. apart. The application of 36,000 kgm. of carbonate of lime as ground chalk or clay marl per hectare gave best yield of rye, oats, and vetch, while 18,000 kgm. gave best yields of barley and oats and fair yields of legumes, oats and grass; 36,000 kgm. of lime reduced the yield of grain 10–15 per cent and reduced grass hay yields 15–20 per cent. On permanent grassland bogs with a 5 cm. layer of sand, lime and marl produced equally good results, but when a 2.5 cm. sand layer was used, marl gave an 8 per cent greater yield than lime. Where no layer of soil was laid, marl gave 33 per cent higher yields than lime. From 20 to 30 per cent increased yields of cereals and grasses were secured from nitrogen fertilizers applied to high peat bogs. Similar results were secured with Chile saltpeter, ammonium sulphate, and liquid manure, while calcic nitrogen was not effective.—The Askov Experiment Station is located in the heather and bog region of western Jutland, a region formerly considered of little value. As a result of drainage and the use of fertilizers, the region is now highly productive.—*Albert A. Hansen.*

5332. Harreveld, J. van. **De samenstelling van dan aanplant 1921–1922.** [The planting of 1921–1922.] Mededeel. Proefsta. Java Suikerindust. 1922: 391–412. 1922.—This paper includes 8 tables giving varieties planted, amount of bouws planted for each variety, and totals for the varieties and for the plantations. The number of bouws in bibitgardens in the plains and amount of imported mountainbibit are likewise given.—*Peter J. Klaphaak.*

5333. Harreveld, J. van. **Statistiek van de verbreiding en de productie der rietsoorten in Oogst 1921.** [Statistics regarding sugarcane varieties from 1921 crop.] Mededeel. Proefsta. Java Suikerindust. 1922: 533–612. 1922.—The paper consists of tables of statistical data obtained from 172 plantations. The varieties planted and percentages of the entire cane production for Java are given as follows: E.K. 28, 38¾; 247 B., 21¼; D. I. 52, 14¾; 100 P.O.J., 6¼; E.K. 2, 6½; 90 F., 3; S.W. 3, 2¼; Tjepiring 24, ¾; other varieties, 6½.—*Peter J. Klaphaak.*

5334. Harrison, L. S. **Graze off the paddymelons.** Agric. Gaz. New South Wales 34: 285. 1923.—A suggestion is made in regard to eradication of *Cucumis Myriocarpus.*—*L. R. Waldron.*

5335. Helm, C. A., and L. J. Stadler. **Productive methods for oats in Missouri.** Missouri Agric. Exp. Sta. Circ. 105. *16 p., illus.* 1922.—A brief popular discussion of oats varieties and culture for Missouri is presented.—*L. J. Stadler.*

5336. Helm, C. A., and L. J. Stadler. **Productive methods for wheat in Missouri.** Missouri Agric. Exp. Sta. Bull. 188. *40 p., 8 fig.* 1921.—Varieties and culture of wheat are discussed on the basis of station and outlying experiments since 1905.—*L. J. Stadler.*

5337. Henderson, G. S. **Report of the Imperial agriculturist.** Sci. Rept. Agric. Res. Inst. Pusa 1921–22: 68–78. *2 pl.* 1922.—The report summarizes operations on the Pusa farm; field experiment work; trials of farm machinery; milk production; and the work of selection of the cross-bred dairy herd.—*Winfield Dudgeon.*

5338. Heuser, Otto. **Versuche über die Standweite der Zuckerrüben.** [Experiments in spacing sugar beet plants.] Illus. Landw. Zeitg. 43: 85. 1923.—The results of experiments on different soil types are reported.—*John W. Roberts.*

5339. Heuser, Otto. **Zur Technik des Zuckerrübenbaues.** [On the technique of sugar-beet culture.] Illus. Landw. Zeitg. 42: 411–413. 1922.—This is a popular article on the growing of sugar-beets.—*John W. Roberts.*

5340. Holmgaard, J. **Bestemmelse af Kornprøvers Sortsrenhed ved Undersøgelse i Laboratoriet.** [Determination in the laboratory of varietal purity of grain samples.] Nordisk Jordbrugsforskning 1922: 361–364. *1 col. pl.* 1922.—At the state seed testing station it is possible to recognize 2-rowed and 6-rowed barley seeds and the common *erectum* and *nutans* varieties. Wheat and rye varieties can be determined in few cases only in the laboratory. In oats the color varies widely with growth and storage conditions, and determination of varieties in the laboratory is hardly possible. Only "Lyngby Hedehavre" may be determined after germination by the color of the first leaf,—grey-violet in light and violet in the dark.—*Ernst Gram.*

5341. Howard, A., and G. L. C. Howard. **Report of the Imperial economic botanists.** Sci. Rept. Agric. Res. Inst. Pusa 1920–21: 8–20. *2 pl.* 1921.—An attempt to solve the problem of production and distribution of improved varieties of wheat among small cultivators has been made in the United Provinces by cooperating with interested estate holders, certain government agencies, and cooperative movements. The number of private seed farms has increased rapidly. Pusa 4, a stiff straw variety of wheat, has yielded $40\frac{3}{4}$ maunds (about 1500 kgm.) per acre under estate conditions. Quick maturing wheats are a necessity in the Plains wheat area; if planted while the ground is too warm in the autumn, white ants destroy the seedlings, and varieties that mature too late in the spring are injured by the advent of the hot dry season. Work is in progress to develop desirable bearded varieties.—Testing and distributing improved varieties of tobacco, *Hibiscus cannabinus*, *H. sabdariffa*, *Cicer arietinum*, *Linum usitatissimum*, and *Carthamus tinctorius* have been carried on. The commercial value of the oil from *Carthamus tinctorius* seed is under investigation.—The deleterious action of grass growing under fruit trees, and the problem of soil aeration are being studied. During the monsoon *Medicago sativa* (lucerne) usually dies from wilt due to poor aeration of the roots, as a result of consolidation of the surface soil. It can be kept healthy by growing on flat raised beds about 1 m. broad, with irrigation trenches between.—*Winfield Dudgeon.*

5342. Howard, A., and G. L. C. Howard. **Report of the Imperial economic botanists.** Sci. Rept. Agric. Res. Inst. Pusa 1921–22: 9–23. 1922.—Over 1,000,000 acres of Pusa wheats are now grown in the United Provinces and the Punjab. Pusa No. 4 and No. 12 wheats show good milling qualities. Bearded wheats developed to resist wild animals and birds give slightly higher yields than Pusa No. 12.—Development and distribution of improved varieties of tobacco, *Hibiscus cannabinus*, *Linum usitatissimum*, *Carthamus tinctorius*, and *Cicer arietinum* have continued, and work is begun on Indian barleys.—Work on soil aeration continues. The cotton plant is very sensitive to poor aeration, and has been found useful for experimental work. To investigate the action of grass on fruit trees, an orchard of 8 locally grown fruit trees was set out in 1914–16. It was divided into 3 parts: 1 under clean cultivation; 1 under complete grass; and 1 under grass, with aerating trenches filled with broken bricks. "The amount of carbon dioxide (in the soil atmosphere) was greatest in the grassed plot, least in the cultivated, and intermediate in the trenched plot. During the rains, the proportion of carbon dioxide rose considerably, particularly in the plots under grass." Root development in *Andropogon sorghum*, *Cajanus indicus*, and *Crotalaria juncea* is being studied in relation to agricultural practice. *Medicago sativa* (lucerne) grown on raised beds with irrigation trenches between does not die out during the monsoon; a crop sown October 20, 1921, has given 8 cuts up to July 11, 1922, yielding at the rate of 70,000 pounds green weight per acre. Lucerne does not set seed readily at Pusa.—Lathyrism, a disease "supposed to be due to long continued consumption of the seed of *Lathyrus sativus*," is being studied. No traces of alkaloid were found in the seed, but alkaloids were found in the seed of *Vicia sativa* a common weed of *Lathyrus* fields. Pollination, unit species, and relation of root development to disease resistance are also being studied in *Lathyrus*.—*Winfield Dudgeon.*

5343. Hyslop, G. R. **Field peas.** Oregon Agric. Exp. Sta. Circ. 34. *2 p.* 1923.—This crop does best in a cool season. Applications of land-plaster and sulphur give good results. Where garden peas or vetch have preceded field peas inoculation is not necessary. Where they are a new crop it is best to inoculate the seed. Early planting is desirable.—Standard varieties for high altitudes and dry-land districts are Kaiser, Bangalia, and Carlton. For that section west of the Cascade Mountains good varieties are White Canadian, Blue Prussian, and Arthur. Seeding should be at the rate of 90–120 pounds per acre. When planted with grain 90 pounds of peas should be used to 1¼–1½ bushels of grain. Under dry-farm conditions peas are planted in double rows about 3 feet apart.—*C. E. Owens.*

5344. Jack, H. W., and W. N. Sands. **Cotton experiments in Malaya.** Malayan Agric. Jour **10**: 248–258. 1922.—As a result of experiments during 2 seasons with several varieties of Egyptian and Sea Island Cotton it is shown that long staple cotton of good average quality can be grown in Malaya with a fair degree of success, as compared with the average of other countries, provided that its cultivation and the time of its sowing are given adequate attention and that pest control is systematized. The cotton-stainer (*Dysdercus cingulatus*) feeds on the seeds of other cultivated plants besides cotton, including Kapok, Roselle, and Hibiscus, and these would have to be destroyed or the pests on them controlled in cotton-growing localities. In the authors' opinion the eastern and northern states of the Peninsula offer the best prospects on account of their more defined wet and dry seasons and their lighter soils.—*R. E. Holttum.*

5345. Jacobsen, L. P. **Forsög med forskellig Afvanding og Sandbelaegning paa Högmose. 1912–1921.** [**Experiments with ditching and drainage on peat soil. 1912–1921.**] Tidsskr. Planteavl **29**: 29–55. 1923.—Results of experiments on the influence of the distance between drainage ditches on yields are reported. The necessity of using layers of sand on soil is explained.—*Albert A. Hansen.*

5346. Johnsen, J. **Jordbundens Indflydelse paa Rødbedernes Stamme-Egenskaber.** [**The influence of soil on the strain characteristics of red beets.**] Gartner-Tidende [Copenhagen] **39**: 151. 1923.—In 1922, 2 strains of red beets, grown for 2 generations on different soil types, were grown for comparison. The seed of one originated from a good, rich soil where the plants developed well, while the other came from a lighter soil where the growth was irregular and the form of the roots inferior. Bad form and color was finally less prominent in the 2nd, though it had more beets with broadly seated leaves and a higher leaf percentage. It is suggested that where beets were grown on poor soil the poor qualities have been apparent to a larger extent and therefore they have been discarded in sorting.—*Ernst Gram.*

5347. Jones, Roy C. **Oats and vetch versus corn or sunflowers for silage.** Oregon Agric. Exp. Sta. Bull. 194. *20 p., 2 fig.* 1922.—As measured by milk yield there is little difference in feeding value of the 3 kinds of silage. Over a series of years sunflower has yielded the largest tonnage, with oats and vetch 2nd, and corn 3rd. During certain favorable seasons, oats-and-vetch gave the highest tonnage. Oats-and-vetch have certain advantages, however, among which are: (1) yield more on heavier, poorly drained soils; (2) fill silo in early summer and keep it from drying out and collapsing; (3) placed in silo in spring and used during summer allows double use of silo, as it can be filled again in fall with corn or sunflowers; (4) require no cultivation; (5) vetch benefits the soil.—*C. E. Owens.*

5348. Knieriene, W. von. **Die starke Stickstoffdüngung der Wiesen als Mittel zur Gewinnung eiweissreichen Futters.** [**Heavy application of nitrogenous fertilizers to meadows for securing protein-rich fodder.**] Mitteil. Deutsch. Landw. Ges. **38**: 384–386. 1923.—Sections of a meadow were fertilized with urea, others with minerals and urea, or with minerals alone; some were left unfertilized. The yields from those receiving complete fertilizers were much greater than from the others and the protein content of the hay was also higher.—*A. J. Pieters.*

5349. Korff, Adolph. **Ueber Queckenvertilgung.** [Concerning the extermination of quack grass (Agropyron repens).] Illus. Landw. Zeitg. 43: 109. 1923.—The planting of crops which shade the ground most is particularly recommended as a means of extermination.—*John W. Roberts.*

5350. Kuijper, J. **Bibit voor orienteerende varieteiten proeven.** [Bibit (cuttings) for varietal experiments.] Arch. Suikerindust. Nederland. Indie 30: 855–867. 1922.—New sugar cane varieties obtainable by planters after December, 1922, for testing under field conditions are listed as follows: 2801 P. O. J. (= 2722 × 2764, = [2364 × EK 28] × [K × EK 2]); 2802 P. O. J. (= 2364 × Tjoek. 154); 2803 P. O. J. (= 2703 × 2713, = [2354 × EK 28] × [2364 × 2571]); 2804 P. O. J. (= 2721 × 2751, = [2364 × EK 28] × [2364 × 920]); 2805 P. O. J. (= 2725 × 247 B, = [2364 × EK 28] × 347 B); 2806 P. O. J. (= 1547 × 247 B, = [213 × 369] × 247 B) These varieties are only a few years old and require thorough testing. All are practically immune to sereh and yellow-stripe disease; only 2806 occasionally shows a few stripe-disease plants.—Gumming disease has not yet been observed among them.—*Peter J. Klaphaak.*

5351. Larsen, J. C. **Dyrkningsforsög med Havresorter. 1915–1920.** [Experiments with oats. 1915–1920.] Tidsskr. Planteavl 29: 56–94. 1923.—Yields of white, grey, and heather oats on newly reclaimed peat soil are compared with yields on other types of soils in other regions.—*Albert A. Hansen.*

5352. Larsen, L. J. **Kartoffelavl i aeldre Tid og nu.** [Potato growing in former days and now.] Jydsk Landbrug 5: 242–244. 1923.—Thirty years ago the potato crop in central Jutland was 4–5 tons per hectare. The potatoes were grown after fallow, manured slightly, cultivated poorly, and not kept free of weeds. At present 25–30 loads barnyard manure, 200 kgm. 18 per cent superphosphate, 150 kgm. potassium salt, and 150 kgm. Norway saltpeter are applied, the potatoes are cultivated, kept free from weeds, and healthy seed potatoes used. In 1922 the average output of 12 fields of the variety Richters Imperator was 34 tons per hectare, and the average of 17 fields of Up-to-Date 35 tons per hectare.—*Ernst Gram.*

5353. Lindhard, E. **Dyrkningsforsög med Sukkerroestammer. 1922.** [Experiments with sugar beets. 1922.] Tidsskr. Planteavl 29: 95–115. 1923.—The experiments give results of trials at the Government experiment stations of Danish strains of sugar beets supplied by Danish seed firms; the yields are compared with those of strains supplied by Swedish and German sugar factories. In general, the majority of the Danish strains yield slightly more root with a slightly smaller percentage of sugar than the so-called standard strains.—*Albert A. Hansen.*

5354. McCall, J. Stewart. **A handbook on cotton and tobacco cultivation in Nyasaland. A guide to prospective settlers.** *85 p.* Government Printer: Zomba, Nyasaland, 1920.—**Cotton cultivation.** *P. 1–62.* Designed for prospective settlers, information is given concerning the environmental needs of cotton, establishing a cotton farm, varieties and selection, cultural and field methods, harvesting and marketing practices, pests and their control, and cotton legislation.—*H. M. Steece.* **Tobacco cultivation.** *p. 64–78.* This part contains a brief discussion of history of tobacco culture in Nyasaland, climate of the region, soils used for tobacco, management of seed beds, transplanting, field management, harvesting and curing. The Virginia or flue-cured type of leaf is produced. Exports for fiscal year ending March 31, 1920, were 4,340,000 pounds. Tobacco soils vary from light sandy loams to stiff red clays and are poor in nitrogen, normal to slightly deficient in phosphoric acid and rich in potash. The most profitable yield of tobacco is 450–550 pounds per acre. The best quality is obtained from virgin or grass land. Only a limited supply of wood is available for curing tobacco and attention to re-afforestation will be necessary to place the tobacco industry on a permanent footing. [See also Bot. Absts. 12, Entry 5288.]—*W. W. Garner.*

5355. Massey, Enrique Molina. **Depósitos para conservación de papas.** [Potato storage.] Bol. Ministerio Agric. Nacion [Argentina] 27: 274–279. *4 fig.* 1922.—The construction of varying types of storage buildings and pits for potatoes is described.—*John A. Stevenson.*

5356. Milligan, S., and W. H. Harrison. **Report of the Director.** Sci. Rept. Agric. Res. Inst. Pusa 1921–22: 1–8. 1922.—The report gives a brief summary of the scientific work of the sections of chemistry, botany, animal nutrition, bacteriology, mycology, entomology, and agriculture, and of the Imperial Dairy Expert and the Sugar Bureau.—*Winfield Dudgeon.*

5357. Paczka, Alejandro. **El cultivo del tabaco en Tlapacoyan.** [Tobacco culture in Tlapacoyan.] Rev. Agric. [Mexico] 6: 617–623. *6 fig.* 1922.—Popular.—*John A. Stevenson.*

5358. Petzke, Egón. **La Fourcroya gigantea una planta textil.** [Fourcroya gigantea, a fiber plant.] Bol. Ministerio Agric. Nacion [Argentina] 26: 403–407. 1921.—A botanical description of the plant is given. Methods of cultivation, harvesting, and preparation of the fiber are discussed with particular attention to the last point since considerable difficulty has been experienced in producing fiber in Argentina.—*John A. Stevenson.*

5359. Reynolds, Mark H., and A. N. Shepherd. **Farmers' experiment plots. Wheat and oat experiments, 1922.** Agric. Gaz. New South Wales 34: 229–237. *2 fig.* 1923.—Experiments were conducted upon a number of private farms. Wheat varieties Bomen, Waratah, and Warren scored high yields for the northwest district. Yields were not increased by the use of phosphates. Very little disease was in evidence.—*L. R. Waldron.*

5360. Russell, E. J. **A great American agricultural cyclopaedia.** [Rev. of: Bailey, L. H. (editor). **Cyclopaedia of farm crops: a popular survey of crops and crop-making methods in the United States and Canada.** *xvi + 699 p., 25 pl., 907 fig.* The Macmillan Co.: New York and London, 1922 (see Bot. Absts. 12, Entry 5290).] Nature 111: 140–141. 1923.

5361. Russell, John. **Rothamsted and agricultural science.** Nature 111: 465–470. *2 fig.* 1923.—The remarkable development of British agriculture between 1843 and 1870 would have been impossible without artificial manures. On the heavy soil at Rothamsted a liberal use of phosphates gives best results, but potash is less effective. On the lighter soil of Woburn, potash is more effective and phosphates in a less degree. Experiments with artificial farmyard manure are being tried. Extensive studies of the bacteria, algae, fungi, and protozoa of the soil have been made. The application of statistical methods to the study of the factors and results is beginning to give results. Figure 2 shows the predictable variation in wheat yields on 5 Broadbalk fields. Weather and soil deterioration figure most prominently on the fields without potash and with no manure. A part of the weather effect, from about $\frac{1}{2}$ in field with barnyard manure, to about $\frac{1}{5}$ on that without potash, can be predicted from the rainfall.—*O. A. Stevens.*

5362. Sagawe, D. **Raubbau und Ertragswert der Landgüter in den Kriegsjahren.** [Exploitation and yield of agricultural estates during the war years.] Landw. Jahrb. 58: 618–644. 1923.—A detailed study of the value of farm yields in Germany during 1913–1919 is reported.—*S. A. Waksman.*

5363. Sayer, Wynne. **Report of the Secretary, Sugar Bureau (India).** Sci. Rept. Agric. Res. Inst. Pusa 1920–21: 85–90. 1921.—The Bureau has collected and disseminated information, given technical advice in sugar production, and conducted experimental work in the development of desirable varieties of cane.—*Winfield Dudgeon.*

5364. Schlumberger, O. **Kartoffelkonservierung und Kartoffelbeizung.** [The conserving of potatoes in storage and the treatment of potatoes with fungicides.] Illus. Landw. Zeitg. 42: 372–373. 1922.—Some of the literature on the subject is compiled.—*John W. Roberts.*

5365. Schultz, E. F. **La grama elephante.** [Elephant grass.] Rev. Indust. y Agric. Tucuman 12: 39–45. *4 fig.* 1921.—*Pennisetum purpureum*, a forage plant native of Africa which has given excellent results in some parts of the world, has been under trial in Tucuman. The seed germinates poorly and a stand can more readily be obtained from cuttings. The rainfall in Tucuman during the time the grass has been under trial has been above normal so that it has not been possible to ascertain its drought-resistant possibilities. The grass was eaten readily by stock and was not injured by trampling or close grazing. Because of its thick stems the grass is not suited for hay but it is thought that with proper handling it may make a good quality silage.—*John A. Stevenson.*

5366. Schurig, A. **Der Anbau des Hanfes.** [The culture of hemp.] Illus. Landw. Zeitg. 42: 387–388. 1922.—This popular article on the culture of hemp includes the choice of soils, varieties, fertilizers, manner and time of seeding and harvesting, and preparation of the soil for seeding.—*John W. Roberts.*

5367. Shepherd, A. N. **Crop rotation on the Murrumbidgee irrigation areas.** Agric. Gaz. New South Wales 34: 249–250. 1923.—A 3-year rotation designed principally for dairymen is suggested as follows: green fodder, such as oats and vetches, the field to be grazed later; sorghum and vetches; and maize sown with cowpeas. Three fields are to be used.—*L. R. Waldron.*

5368. Sörensen, Hakon. **Dyrkningsforsog med Sorter og Stammer af lave Marvaerter, 1919–1921.** [Experiments with varieties of peas, 1919–1921.] Tidsskr. Planteavl 28: 807–833. 1922.—The following varieties of peas were used: American Wonder, London Wonder, Record, Wonder of Witham, Coopers Market, Carter's Daisy, and Strategem.—*Albert A. Hansen.*

5369. Terrell, George B. **Fifteenth annual report of the Commissioner of Agriculture of Texas.** 1–47. 1922.—In this report are incorporated the reports of: J. M. Del Curto, division of plant pathology and seeds; E. L. Schostag, division of orchard and nursery inspection; R. E. Yantis, division of statistics; J. M. Burkett, division of edible nuts; R. E. McDonald, division of entomology; and E. W. Cole, bureau of markets. Statements regarding the divisions are added.—*Mary R. Burr.*

5370. Thatcher, L. E. **The status of the soybean crop in Ohio.** Monthly Bull. Ohio Agric. Exp. Sta. 8: 59–64. 1923.—The data presented are based on information gained from questionnaires sent to 300 soybean growers in the state. It is thought that at the present rate of increase the next decade will see soybeans rivaling oats for a place as the major crop in the State. Ito San is the most popular variety followed closely by Midwest. Manchu, Medium Green, Wilson, and Elton are also grown. Suggestions are given as to the relative merits of each variety for serving the needs of the Ohio farmers; also brief discussions are devoted to dates of seeding, methods, rate and manner of seeding and harvesting. A list of 61 varieties with protein and oil content is appended.—*R. C. Thomas.*

5371. Tonnelier, Carlos R. **Instrucciones practicas para la cosecha de trigo, lino, cebada, centena, avena, y maiz.** [Practical instructions for harvesting wheat, flax, barley, rye, oats, and corn.] Bol. Ministerio Agric. Nacion [Argentina] 26: 408–426. 1921.—Popular.—*John A. Stevenson.*

5372. Valentine, Max. **Tobacco for Victorians. Seed beds for bright tobacco.** Jour. Dept. Agric. Victoria 19: 722–726. 1921.—Recommendations are made regarding selection of sites for seed beds, most suitable soil, methods of preparing and sterilizing the soil, sowing the seed, covering the beds, and care of the seedlings. Because of uncertainty as to seasonal conditions several beds should be planted in different locations and on different dates, thus providing for varying soil-drainage and temperature requirements. Only freshly cleared land is used. The best soil is a deep, friable, light sandy loam. To destroy weed seeds, fungi, and soil insects the soil is sterilized by surface burning or by steaming. After seeding, a frame 6 inches high is placed around the bed and covered with cheese cloth.—*W. W. Garner.*

5373. Vallejo, Carlos. **El cultivo de papas en los Estados Unidos.** [Potato culture in the United States.] Bol. Ministerio Agric. Nacion [Argentina] 27: 280–307. *27 fig.* 1922.—The cultivation of potatoes in the U. S. A., including cultivation, varieties, harvesting, storing and yields is discussed.—*John A. Stevenson.*

5374. Vuillet, F. **La culture du coton égyptien dans l'Arizona. Rapport de mission aux États-Unis.** [The culture of Egyptian cotton in Arizona. Report of the mission to the United States.] *84 p., 16 illus.* Émile LaRose: Paris, 1922.—The report begins with the history of the introduction into the U. S. A. of Egyptian cotton, stating how a cooperative association was formed for its culture under irrigation, thus assuring the necessary water for irrigation and the drainage of the valley land. Roosevelt Reservoir, Granite Reef Dam, and Joint Head are described. Insect injury is noted together with methods of control. Tables show the annual production in the Salt River Valley and sale price of the cotton. In 1914 an association was formed known as the Arizona Pima Cotton Growers. The report closes with a commercial classification of the Pima variety.—*Grace M. Weston.*

5375. Warth, F. J. **Report of the Imperial Agricultural Chemist.** Sci. Rept. Agric. Res. Inst. Pusa 1920–21: 21–27. 1922.—Methods of nitrogen determination have been tested. In investigations of enzyme content and action in sugar cane it is found that windrowing the cane under proper conditions increases the output of sugar. The ratio of oxygen to CO_2 in the soils has been determined and shows striking differences between the grassed and cultivated plots. The ratio for the latter was found to vary between 86 and 60, whilst in the grassed plots the corresponding figures were 63.6 and 8.3. Soils of the Institute farm have been examined and correlated as far as possible with crop production.—*Winfield Dudgeon.*

5376. Weber, C. A. **Der jährliche Saatgutbedarf Deutschlands zur Anlage und Verbesserung des landwirtschaftlich nutzbaren dauernden Grünlandes.** [The annual seed requirements of Germany for laying down and improving agriculturally valuable grass lands.] Mitteil. Deutsch. Landw. Ges. 38: 272–274. 1923.—The author has made an estimate of these seed requirements for the more important meadow and pasture grasses and legumes, and presents the figures in a table and discusses their significance.—*A. J. Pieters.*

5377. Weidner. **Die Entwicklung des Flachsbaues in Bäyern.** [The development of flax culture in Bavaria.] Illus. Landw. Zeitg. 42: 252–253. 1922.—This is an historical sketch of flax culture in Bavaria with statistical tables showing its development.—*John W. Roberts.*

5378. Weiss, F. **Die Stickstoffdüngung der Luzerne und anderer Schmetterlingsblütler.** [Nitrogen fertilization for alfalfa and other legumes.] Illus. Landw. Zeitg. 43: 117–118. 1923.—Experiments are reported which show beneficial results from the moderate use of nitrogenous fertilizers.—*John W. Roberts.*

5379. Wigglesworth, A. **The new era in flax.** Jour. Textile Inst. 14: 109–117. 1923.—Since linen manufacture was introduced into Ireland by the Huguenots over 3 centuries ago, there had been, until 1914, a steady expansion in the volume of linen manufactured, and a corresponding increase in flax fiber. Russia became the chief source of supply. The exports of flax from Russia increased from 167,000 cwt. in 1749 to 4,379,000 cwt. in 1907. The production in Russia decreased from 1907 to 1914, due partly to decreased acreage, but more to decreasing yield per acre. In 1880 the average yield of flax fiber in Russia was about 400 pounds per acre, and just before the war it had fallen to about 270. Since the war the flax position in Russia has become still worse, and an early return to pre-war conditions seems impossible. An important new field for fiber flax production has been established at elevations of 7,000–9,000 feet in Kenya Colony, with 20,000 acres yielding flax fiber that has been thoroughly tested by the Belfast College of Technology and proved to be superior to Russian flax. Kenya is the first province in the world to appoint officially qualified flax officers to inspect and grade flax. The Linen Research Association of Belfast, Ireland, has conducted important studies on the physi-

cal properties of plant fibers, and has developed a strain of flax yielding 28 per cent more fiber than ordinary commercial fiber flax. The U. S. A. Department of Agriculture has also developed by plant breeding since 1909, the variety "Saginaw" which is more vigorous, more uniform, and in many characters superior to commercial fiber flax. Improvements are being made in machinery for harvesting, thrashing, and scutching flax. A better market must be developed for flax fiber, and to do this it is suggested that more high grade and well finished linen fabrics be produced commanding high prices and yielding a return for higher priced flax fiber.—*L. H. Dewey.*

5380. Zequeira, Luis Cuevas. La selección de la semilla en el cultivo del maiz. [Seed selection in the cultivation of corn.] Rev. Agric. Puerto Rico 6[4]: 9–10. 1921.—The author emphasizes the importance of all possible care in seed selection in corn cultivation.—*John A. Stevenson.*

5381. Zequeira, Luis Cuevas. La selección de la semilla en el cultivo del maiz. La caja germinadora. [Seed selection in corn culture. The germinating box.] Rev. Agric. Puerto Rico 6[7]: 17–19. 1921.—An apparatus for testing the germinating power of seed corn is described.—*John A. Stevenson.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Carroll W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 5361, 5374, 5377, 5424, 5435, 5448, 5461, 5510, 5644, 5697, 5799, 5812, 5866, 5884, 5892, 5898, 5903, 5921, 5926, 5957, 6007, 6019, 6067, 6076, 6116, 6124)

5382. Anonymous. Current topics and events. Nature 111: 508. 1923.—Reference is made to Botanical Abstracts and the suggestion to publish Biological Abstracts in its stead. The writer agrees with Cockerell's preference for an analytical index such as the Zoological Record; but in view of the difficulties the latter publication has had, the feasibility seems doubtful.—*O. A. Stevens.*

5383. Anonymous. Imperial College of Science and Technology. Nature 111: 295–296. *2 fig.* 1923.—This is a general account of the history and work of the Department of Botany (Plant Technology) of the College, with exterior and interior views of its new building in London.—*O. A. Stevens.*

5384. Anonymous. Prof. Dr. Kamiel Vermoesen. Natuurw. Tijdschr. 4: 248. 1922.—Kamiel Vermoesen died December 17, 1922. He was plant physiologist at the University of Louvain, and a specialist on the flora of the Congo. In relation to modern views of crystallography, he studied pollen grains of different groups of plants, investigations which were unfinished at his death.—*J. C. Th. Uphof.*

5385. Anonymous. Professor Emile Perrot. Amer. Druggist and Pharm. Rec. 70: 22–23. *3 fig.* 1922.—This is a brief account of the achievements of this versatile worker as student, professor of materia medica, and investigator of medicinal and economic plants of Europe and Africa.—*C. M. Sterling.*

5386. Anonymous. Une religieuse naturaliste,—Feu Soeur Marie-de-Sainte-Amélie. [A nun naturalist—the late Sister Marie-de-Sainte-Amélie.] Nat. Canadien 48: 265–267. 1922.—The Rev. Sister belonged to the Convent of the Holy Cross of Saint-Laurent, near Montreal, and died Feb. 17, aged 71 years. Her herbarium, which won prizes at both Montreal and Chicago, contained 1,800 plants mounted and scientifically classified in 20 volumes. From 1890 to 1922 she had charge of the "Annales" and the "Bulletin" of the Museum at Saint-Laurent.—*A. H. MacKay.*

5387. Anonymous. [Rev. of: Dawson, W. H. (editor). **The Yearbook of the Universities of the Empire, 1923. Published for the Universities Bureau of the British Empire.** *xii + 692 p.* G. Bell and Sons: London, 1923.] Nature **111**: 459. 1923.

5388. Anonymous. **A yearbook of the learned world.** [Rev. of: **Index Generalis: Annuaire général des universités, grandes écoles, académies, archives, bibliothèques, instituts scientifiques, jardins botaniques et zoologiques, musées, observatoires, sociétés savantes. (General index of universities, scientific institutes, museums, learned societies, etc.)** Published under the direction of R. de Montessus. *2111 p.* Gauthier-Villars et Cie: Paris, 1923 (see Bot. Absts. 11, Entry 2239).] Nature **111**: 425–426. 1923.—The reviewer regards the execution of the work as excellent, but finds a considerable number of omissions and errors in entries relating to the British Empire. He suggests that the editor might better have used the Yearbook issued by the Universities Bureau as a basis instead of depending upon the replies to his questionnaires received from the different institutions.—*O. A. Stevens.*

5389. Anonymous. **Scientific societies in the British Isles.** [Rev. of: **The year book of the scientific and learned societies of Great Britain and Ireland: a record of the work done in science, literature, and art during the session 1921–22 by numerous societies and government institutions. 39th annual issue.** *vii + 374 p.* C. Griffin and Co.: London, 1922 (see Bot. Absts. 12, Entry 2285).] Nature **111**: 389. 1922.

5390. Bullock, Samuel Dilman. **La granja Norteamericana y algunos aspectos de la vida rural. [The North American farm and some aspects of country life.]** Rev. Facultad Agron. y Veterinaria Univ. Nacion. Buenos Aires **4**: 14–23. 1922.—This begins with a historical sketch of the farming industry in the U. S. A. as affected by colonial conditions and by later government policy in the distribution of public lands. Both influences tended to produce numerous independent farms of comparatively small area. Statistics of rural population, crops, and stock are given for the state of Wisconsin, and there is an account of agricultural organizations and of educational facilities and government aid available for the farmer.—*C. A. Weatherby.*

5391. Chevalier, A. **Octave Lignier, 1855–1916.** *19 p., 1 pl.* Paris, 1920.—This is an account of the life of M. Lignier, professor of botany at the University of Caen, of his work as a teacher, and of his researches in the anatomy of plants, paleobotany, and evolutionary morphology.—*C. A. Weatherby.*

5392. Christensen, C. **Otto Friederich Müller, specielt som Botaniker. [Otto Friederich Müller, especially as a botanist.]** Nat. Verden **6**: 49–68. *Portrait.* 1922.

5393. Cockerell, T. D. A. **Sir Isaac Bayley Balfour.** Nature **111**: 150. 1923.—*Primula Rusbyi* Greene and *P. Ellisiae* Cockerell, occupying different mountain ranges in New Mexico, are so similar in appearance that a German writer pronounced them identical. The writer procured seed of *P. Ellisiae* for Prof. Balfour, who grew the plants at Edinburgh and demonstrated that the 2 species were distinct.—*O. A. Stevens.*

5394. Colon, E. D. **Breve reseña del desenvolvimiento de la agricultura en Puerto Rico. [Brief résumé of the development of agriculture in Porto Rico.]** Rev. Agric. Puerto Rico 8^2: 49–53. 1922.—The author presents an outline of the various stages through which the agriculture of the Island has passed from the time of the aboriginal inhabitants to the end of the Spanish regime.—*John A. Stevenson.*

5395. Colon, E. D. **Instituciones relacionadas con la agricultura. [Agricultural institutions.]** Rev. Agric. Puerto Rico 9^5: 7–11. 1922.—Agricultural experiment stations were founded by the Spanish government at Rio Piedras and Mayaguez, Porto Rico, in 1880 and continued until 1897. An outline of the experimental work carried on by these stations, covering all of the principal crops, is given.—*John A. Stevenson.*

5396. Colon, E. D. **Introducción de especies extranjeras.** [Introduction of exotic species.] Rev. Agric. Puerto Rico 9^2: 20–23. 1922.—The dates when the various economic plants were first brought to Porto Rico, together with the name of the importer, are given.—*John A. Stevenson.*

5397. Davy De Virville, A. D. **Gaston Bonnier.** Nat. Canadien 49: 222–223. 1923.—A biographical sketch is presented of the great botanist of France who died Dec. 30, 1922.—*A. H. MacKay.*

5398. Drude, Oscar. **Bernhard Schorler.** Sitzungsber u. Abhandl. Naturwiss. Ges. "Isis" 1920–21: xiv-xvii. 1922.—An account is given of the botanical activities of Bernhard Schorler, who died Apr. 1, 1920. He was an ardent student of the vascular plants of Saxony and also of the cryptogams, his interests being both floristic and ecological. In 1905 he undertook a revision and expansion of Otto Wünsche's Sächsische Excursionsflora, the new work appearing under the title, Die Pflanzen Sachsens. The 11th edition of this publication, which is perhaps his most important contribution to botany, appeared in 1919.—*A. W. Evans.*

5399. Dudgeon, Winfield. **The Madras meeting of the Indian Botanical Society.** Jour. Indian Bot. 3: 22–25. 1922.—This is a brief account of the first scientific meeting of the Society at Madras in January, 1922. The program of 34 papers is given.—*Winfield Dudgeon.*

5400. [Fyson, P. F.] **Editorial.** Jour. Indian Bot. 3: 29. 1922.—The Journal of Indian Botany, started privately by P. F. Fyson and financed by T. R. D. Bell, late Chief Conservator of Forests, Bombay, has become the property and official organ of the Indian Botanical Society.—*Winfield Dudgeon.*

5401. [Fyson, P. F.] **Editorial note.** Jour. Indian Bot. Soc. 3^6: 2nd cover page. 1923.—"The Journal of Indian Botany . . . . will henceforth be styled the Journal of the Indian Botanical Society."—*Winfield Dudgeon.*

5402. Hasund, S. **Havren i Sagatids-Jordbruget.** [Oats in the agriculture of the saga age.] Nordisk Jordbrugsforskning 1922: 297–306. 1922.—In the sagas and tales from 900 to 1300, oats, now the principal grain in Norway, is not mentioned. But it was cultivated about the years 400 and 800, and very soon after 1300. When oats is not mentioned, as are "barley" and "grain," the reason is sought in (1) a growing of barley and oats in mixture, (2) an admitted computation of oats in units of barley flour.—*Ernst Gram.*

5403. Hecke, G. H. **G. Harold Powell: A tribute.** Monthly Bull. California Dept. Agric. 11^{10}: *1 unnumbered p., 1 pl.* 1922.

5404. Hecke, G. H. **John Charles Whitten: A tribute.** Monthly Bull. California Dept. Agric. 11^{10}: *1 unnumbered p., 1 pl.* 1922.

5405. Kofoid, Charles Atwood. **Pasteur and the science of biology.** Sci. Monthly 16: 658–662. 1923.—This is an appreciation of Pasteur and his work.—*L. Pace.*

5406. Lange, A. **Nogle omdannede Plantenavne.** [Some transformed plant names.] Nat. Verden 6: 424–430. 1922.—Latin names have often been transformed into common names of somewhat similar sound, but frequently of quite different meaning. For example, Semen foeni graeci has passed through Foenum graek, Freum graek, Fillegraek, Tillegraek, Tillegraf to become "Telegraph seeds." *Levisticum* has in German many vulgar names composed of Liebe, Laub, Lauf and Stock, Stickel. The same thing has happened in Danish; the author lists 60 transformations of *Levisticum.*—*Ernst Gram.*

5407. Lyman, G. R. **Report of the fourteenth annual meeting of the American Phytopathological Society.** Phytopathology 13: 188–198. 1923.—The report includes a general report of the sessions of the Society held in the buildings of the Massachusetts Institute of Technology, Cambridge, Massachusetts, Dec. 27–30, 1923; the report of the Treasurer for 1922; the report of the Editor-in-Chief of Phytopathology; report of the retiring representative on the Board of Control of Botanical Abstracts; action of the Society on the Union of American Biological Societies; a report of the Advisory Board; reports of various committees; report of a discussion of the proposed Tropical Institute of Phytopathology; and reports of other miscellaneous business.—*B. B. Higgins.*

5408. Oye, Paul van. **De oekonomische beteeknis der natuurwetenschappellijke onderzoekingen in Nederlandsch-Indie. [The economic significance of biological research in the Dutch East Indies.]** Natuurw. Tijdschr. 4: 197–208. 1922.—The Dutch East Indies have been in possession of the Netherlands for 300 years. In early times no official attention was paid to biological subjects. Persons interested in them (e.g., medical men employed by rich private individuals) worked independently and usually with small means. But they gathered plant and animal material and contributed considerably to form a foundation for the study of the natural sciences. In this way originated Ambonsche Rariteitskamer, Hortus Malabaricus, and many other important works. Now experts regard the Dutch East Indies as an example of a colony well organized for biological and agricultural work. Mention is made of the botanical garden at Buitenzorg and of the Department of Agriculture of Java with its numerous branches, a system closely connected with the name of Melchior Treub.—*J. C. Th. Uphof.*

5409. Praeger, R. Lloyd. **Henry William Lett.** Irish Nat. 30: 41–43. 1921.—This Irish botanist was noted chiefly for his work among the bryophytes.—*W. E. Praeger.*

5410. Russell, E. J., and A. Henderson Smith. **Discovery of the use of phosphates as fertilizers.** Nature 111: 116–117. 1923.—The idea of utilizing raw mineral phosphates as fertilizer is usually supposed to date from 1840. In May, 1837, however, an unnamed writer in the Farmers' Magazine (2d series) proposed making "fictitious bone dust by impregnating lime with phosphoric acid" and another (same date) stated that phosphate of lime, if available to the farmer, would be invaluable and that there were entire mountains of it in Spain.—*O. A. Stevens.*

5411. Tidestrom, Ivar. **The floral alphabet of the Celts.** Torreya 23: 41-49. *1 fig.* 1923.—The names of the letters in the Celtic alphabet are all plant names. For example, A in Gaelic is *ailm,* which is also the word for "elm." These names are compared with their cognates in English, Anglo-Saxon, Old Norse, and Swedish.—*J. C. Nelson.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 5290, 5383, 5423, 5428, 5435, 5440, 5606, 5918)

5412. Clute, Willard N. **Botany for beginners-VI.** Amer. Bot. 29: 53–57. 1923.

5413. Clute, Willard N. **Plant names and their meanings—XV. Scrophulariaceae.** Amer. Bot. 29: 60–67. 1923.

5414. Dudgeon, Winfield. [Rev. of: Molisch, Hans. **Mikrochemie der Pflanze. [Microchemistry of plants.]** *2nd ed., 434 p., 135 fig.* Gustav Fischer: Jena, 1921 (see Bot. Absts. 12, Entry 5169).] Jour. Indian Bot. 3: 119. 1922.

5415. F[yson], P. F. [Rev. of: Fritsch, F. E., and E. J. Salisbury. Botany for students of medicine and pharmacy. *346 p., 163 fig.* G. Bell and Sons: London, 1921.] Jour. Indian Bot. 3: 123–124. 1922. [See also Bot. Absts. 12, Entry 1009.]

5416. F[yson], P. F. [Rev. of: Jivanna Rao, P. S. Lessons in water plants. Jour. Madras Agric. Students Union 10: *20 p.* 1922.] Jour. Indian Bot. 3: 121. 1922.

5417. F[yson], P. F. [Rev. of: Rangachari, K. Manual of elementary botany for India. *2nd ed., 518 p., 471 fig.* Government Press: Madras, 1921 (see Bot. Absts. 11, Entry 3454).] Jour. Indian Bot. 3: 124. 1922.

5418. F[yson], P.F. [Rev. of: Tansley, A. G. The elements of plant biology. George Allen & Unwin: London, [1922] (see Bot. Absts. 12, Entry 3809).] Jour. Indian Bot. 3: 183–184. 1923.

5419. Huxley, Julian S. Biology in schools. School Sci. Rev. [London] 4: 5–11. 1922.—The function of biology in school curricula is shown. Interest in animals is more easily aroused than in plants, the main link between the inorganic and organic. Evolution is most easily taught in connection with organisms, especially the idea of direction in evolution. This leads to the relation of mind to matter, and shows that increased mental power is of immense importance in biological evolution.—*Elsie Hammond.*

5420. Strasburger, E., und Max Koernicke. Das botanische Practicum. *7th ed., 883 p., 260 fig. (3 col.)* Gustav Fischer: Jena, 1923.—In comparison with the 6th edition of 1921 this well known work is increased by 10 pages and 13 figures. Numerous changes have been made in the text. The chapter on *Saprolegnia* has been extended. More attention is given to the red algae. Citations of literature have been considerably increased. Register IV, p. 711–842, presenting a compact consideration of reagents, stains, etc., is printed on another color of paper to facilitate consultation.—*J. C. Th. Uphof.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 5598, 5624, 5629, 5635, 5742, 5764, 5768, 5809, 5922, 5952, 5954)

5421. Argaud, R. Sur la présence intra-nucléolaire du centrosome. [On the existence of an intra-nucleolar centrosome.] Compt. Rend. Acad. Sci. Paris 174: 1078–1080. *2 fig.* 1922.—This peculiar condition is found in certain cells of man.—*C. H. Farr.*

5422. Becquerel, Paul. Observations sur la nécrobiose du protoplasme végétal avec l'aide d'un nouveau réactif vital. [Observations on the necrobiosis of vegetable protoplasm with the aid of a new intravital reagent.] Compt. Rend. Acad. Sci. Paris 176: 601–603. 1923.—The basic aniline dyes are used as intravital stains. They are absorbed by the vacuole, but do not enter the cytoplasm and nucleus while the cell is alive. Necrobiosis is the name given to the change of protoplasm from the living to the dead condition. Scale leaves of bulbs of *Allium cepa* were treated with a mixture of 2 parts of methylene blue with 1 part of Bismarck brown and one part of neutral red and remained alive in this solution for as long as 24 hours. During this time the plasma membrane is green, the protoplasm a pale yellow, the vacuoles a rose brown, and the spheric microsomes a translucent green. The parietal cytoplasm is readily seen to circulate. It is thus apparent that the methylene blue does not stain the cell while it is alive. However, when death occurs the nucleus becomes green with a tint of brown and the 2 nucleoli become blue. The cytoplasm takes on a greenish blue tint, and the vacuole seems to disappear. Observations with the microscope and ultramicroscope indicate that necrobiosis is always accompanied by an irreversible colloidal transformation of the funda-

mental substance of the cytoplasm and nucleoplasm. This is a change from a homogeneous gel to a heterogeneous granular gel more or less vacuolate and reticular. This is perhaps due to a change in the nature of the electrical charges of the molecules of the cytoplasm which are negative in life and positive in death. This is indicated by the fact that they absorb in the latter state the negative molecules of methylene blue.—*C. H. Farr.*

5423. Carothers, E. Eleanor. **The cell mechanism.** [Rev. of: Sharp, Lester W. **Introduction to cytology.** McGraw-Hill Book Co.: New York, 1921.] Jour. Heredity **12:** 351–353. 1921.—That cytology is "one of the most actively developing biological sciences is indicated by the appearance in little more than a year of three new textbooks on the subject, two from England and the American one which is the subject of this review." The reviewer considers Sharp's book "well planned and modern in its view-point," naming its bibliographies, efficient index, and text-figures among other good points. Lack of clearness and accuracy are noted in some places, but the "book seems adapted to meet the needs of several classes of people" and "especially useful since it stresses the views of the botanists and makes their results more readily accessible." [See also Bot. Absts. 11, Entries 230, 2476, 3448; 12, Entry 5428.]—*Oliver Olson.*

5424. Cheshire, Frederick J. **The early history of the polariscope, and the polarizing microscope.** [**Presidential address, Royal Microscopical Society, London, read January 17, 1923.**] Jour. Roy. Microsc. Soc. London **1923:** 1–8. *8 fig.* 1923.—The paper refers briefly to the use of the polarizing microscope in the examination of biological material.—*R. E. Cleland.*

5425. Conn, H. J., S. I. Kornhauser, Thomas Mallory, F. G. Novy, and L. W. Sharp. **American eosins.** Science **56:** 689–690. 1922.—This brief report of the Commission on Standardization of Biological Stains explains the differences in chemical composition of the several eosins on the market. As compared with the Grübler eosins, the American samples tested proved to be better in almost every case.—*C. J. Lyon.*

5426. Dangeard, Pierre. **Le vacuome dans les graines de pollen des Gymnospermes.** [**The vacuome of the pollen grains of gymnosperms.**] Compt. Rend. Acad. Sci. Paris **176:** 915–917. *Fig. 1–5.* 1923.—A study is reported of the development and germination of the pollen grains of *Taxus baccata, Cephalotaxus Fortunei,* and some of the Cupressineae by means of intravital stains.—*C. H. Farr.*

5427. Denham, H. J. **A micrometric slide rule.** Jour. Roy. Microsc. Soc. London **1923:** 57–61. *2 fig.* 1923.—A simple device is described by which large numbers of microscopical measurements at different magnifications can be quickly made.—*R. E. Cleland.*

5428. Dudgeon, Winfield. [Rev. of: Sharp, Lester W. **An introduction to cytology.** *xiii + 452 p., 159 fig.* McGraw-Hill Book Co.: New York and London, 1921.] Jour. Indian Bot. **3:** 119. 1922. [See also Bot. Absts. 11, Entries 230, 2476, 3448; 12, Entry 5423.]

5429. Farr, Clifford H. **Quadripartition by furrowing in Sisyrinchium.** Bull. Torrey Bot. Club **49:** 51–61. *Pl. 2.* 1922.—A summary is given of recent work done on quadripartition of pollen-mother-cells in various dicotyledons. In *Sisyrinchium Bushii* Bicknell much the same manner of quadripartition was found.—*P. A. Munz.*

5430. Gelei, J. **Weitere Studien über die Oogenese des Dendrocoelum lacteum. III. Die Konjugationsfrage der Chromosomen in der Literatur und meine Befunde.** [**Further studies on oogenesis in Dendrocoelum lacteum. III. The question of chromosome conjugation in the literature and my investigations.**] Arch. Zellf. **16:** 299–370. *1 fig.* 1922.—The author continues his studies upon *Dendrocoelum lacteum* with a discussion of the subject of chromosome conjugation. He first reviews the terminology adopted previously by him:

presyndesis referring to the early heterotypic prophase before synapsis or synezesis; syndesis including the remaining stages up to the first metaphase, in turn subdivided into eusyndesis (diplotène, strepsinema), and chalasthosyndesis (diakinesis). The results of his studies are fully discussed, with their bearing upon the work of other authors. The first oocyte division is the reduction division. This is preceded by a distinct resting stage. In early prophase the chromosomes become distinct as long threads, which are clearly single in structure. No evidence is found of parallelism or an approximation of threads during this stage, or of a split in the chromosomes during the previous telophase. Following early prophase, the ends of the threads become associated closely at one side of the nucleus, forming more or less radiating loops—the "bouquet" (Schleifenbukett). The number of loops is greater than the haploid of chromosomes. The threads are distinctly and regularly beaded. The conjugation of chromosomes follows. There is no question but that this is a longitudinal fusion of whole chromosomes. Conjugation is brought about by the fusion of the leptotene loops of the "bouquet" in pairs, fusion beginning at the "pole" end, where the thread ends approximated, and proceeding to the distal end of the loops. The conjugated or diplotène thread is thicker than the leptotène. Conjugation is an intimate fusion of threads, not merely an approximation. "By longitudinal conjugation of chromosomes we mean the fusion, beginning at the end, of two homologous chromosomes, one descended from the male, the other from the female parent, in such a way that the qualitatively equal parts of the conjugants always fuse. * * * it makes possible not only the reduction in number of the chromosomes, but also the mixing of their contents, and their reconstruction." Early in the conjugation period, crossing over may take place.—In the more purely theoretical part of the paper the question is asked as to whether there is any sex difference between the chromosomes of the 2 sexes, and the author concludes that there is none. If 2 sperms or 2 eggs could be made to fuse and develop, an entirely normal individual would be produced. The phylogenetic history of chromosome conjugation is discussed. Cell fusion is a necessary forerunner of chromosome conjugation, which in turn is essential to chromosome reduction. In evolution, therefore, the original cells were haploid and these in time began to fuse. Chromosome conjugation followed, at first in an end to end fashion, and finally longitudinally, and the reduction in number of chromosomes appeared last of all. A discussion of the meaning of the "bouquet" follows, the conclusion being that this arrangement is for the purpose of bringing together the homologous chromosomes in such a way that they can conjugate. A good bibliography follows.—*Ralph E. Cleland.*

5431. Gillis, J. **Is het mogelijk dat een enkelvoudige zetmeelkorrel twee "navels" zou bezitten? [Can a simple starch grain possess two "navels"?]** Natuurw. Tijdschr. 4: 162–166. *5 fig.* 1922.—In studying the optical properties of the starch grain in polarized light, the starch layers are compared with concentric spheres of which the navel, or "nucleus," is the geometrical center. According to Reychler the concentric layers are formed in circles round the longest axis, consequently are conaxial. The writer states the starch grain contains either 1 navel or that there are at the ends of the axis "polar points." The simple starch grains are entirely surrounded by the substance of the starch, in which form the concentric or excentric layers, and contains but 1 "nucleus."—*J. C. Th. Uphof.*

5432. Herrera, A. L. **Sur l'imitation des plasmodies et des structures chromatiques avec le silicate de sodium noirci par le noir l'ivoire et des gouttes d'alcool en diffusion. [On the imitation of plasmodia and chromatic structures by diffusing drops of alcohol through sodium silicate blackened with ivory back.]** Compt. Rend. Acad. Sci. Paris 176: 1011–1012. 1923.—By this means it is possible to imitate plasmodia, cells, nuclei, and chromatin structures. Plasmodia show a movement of short duration, also a tendency to contract. Nuclei with chromosomes may be simulated by using the alkaline silicate. The structures undergo a sort of karyolyse.—*C. H. Farr.*

5433. Hogben, Lancelot. **The problem of synapsis.** Jour. Roy. Microsc. Soc. London 1920: 269–276. 1920.—There is no justification for the assumption that there is any difference between the paternal and maternal moieties contributed to the zygote in relation to the

specific and generic characters of the organism, or between the role of cytoplasm and nucleus in the same regard. The claim that chondriosomes transmit "non-mendelian" characters is ill founded. It is necessary, in connection with the chromosome theory of character transmission, to demonstrate that the "reduction" segregates chromosome pairs into maternal and paternal components, and further that the chromosomes of one generation correspond to those of another. The continuity, numerical constancy, morphological constancy and behavior in hybrids indicate the correctness of these assumptions. The behavior of the accessory chromosome also bears on this point. The parasynaptic and telosynaptic views bear on the mechanism of synapsis, but the latter view has scant direct observational evidence. The study of individual chromosomes and the re-study of reported telosynaptic cases have often tended to favor the parasynaptic view. The situations in plants and animals have been confused. Among the questions that arise are: (1) is there evidence that the chromatin elements conjugate? (2) are such elements really chromosomes? (3) are these subsequently disjoined? "It will thus be seen that while the chromosome hypothesis has proved a great incentive to research—particularly in the problem of sex—its major premise, the reality of synapsis, is in no way firmly established; further knowledge of the relation of chromosomes to the organization of the resting nuclei and a specialized study of individual heterotype chromosomes constitute, therefore, two of the most imperative needs of cytological theory today."—*Wm. Randolph Taylor.*

5434. Loewenthal, Hans. **Die Oogenese von Tubifex tubifex (Müll.). (Zur Kritik der "Kernverschmelzung" Oschmanns.)** [**Oogenesis in Tubifex tubifex. In criticism of the "nuclear fusions" of Oschmann**] Arch. Zellf. **16**: 231–237. *Pl. 14.* 1922.—The author discusses a paper of Oschmann (1914) in which the latter describes in *Tubifex bavaricus* a process by which the egg is formed through a fusion of many oocytes and their nuclei. Such a process would compel a revision of our ideas concerning the constancy of chromosome number and individuality. Oschmann states (1919) that there are here "no cell organs, neither chromosomes, nucleolus, centrospheres, centrosomes, centrioles, etc., nor nucleus and cytoplasm." The author shows that in *T. tubifex*, while the central oocytes, which act in a nourishing capacity, degenerate, and their nuclei fuse, the peripheral oocytes of the complex do not fuse, but give rise individually to eggs. The results given in this paper therefore tend to discredit the cytological ideas of Oschmann above mentioned.—*Ralph E. Cleland.*

5435. Lundegårdh, Henrik. **Zelle und Cytoplasma.** [**Cell and cytoplasm.**] In: **Handbuch der Pflanzenanatomie.** Edited by K. Linsbauer. I Abt., 1 Teil: **Cytologie**, Band 1. *xii + 402 p., 195 fig.* Borntraeger: Berlin, 1922.—This is a comprehensive review of our knowledge of the plant cell as regards its general features and its behavior in the formation of tissues, together with a detailed discussion of cytoplasm and cytoplasmic structures other than plastids, which are to be treated in a separate volume of the series.—The contents of the work may be briefly indicated as follows: The introduction consists of an account of the historical development of cytology and plant anatomy. The 1st principal section, The Cell, comprises 11 chapters dealing with the following main topics: nomenclature; the morphological organization of the cell (including brief mention of the nucleus and its division, treated fully in the volume by Tischler [see Bot. Absts. 12, Entry 5448]; symmetry, size and form of the cell; protoplasmic connections and cell fusions; the role of the cell in tissue formation and the possible causes underlying this process; types of cell aggregates; tissues and tissue systems; the physical and chemical organization of the cell, including a discussion of theories of elementary structure. In the 2nd section, The Cytoplasm, there are 10 chapters dealing with nomenclature and methods, the form of the cytoplasmic body, the structure of cytoplasm, consistency and degeneration phenomena, alloplasmatic structures (chiefly the achromatic figure), cytosomes (chondriosomes), the Hautschicht, vacuoles, cilia, and cytoplasmic movement.—The book has a very extensive bibliography, and is supplied with author and subject indexes.—*L. W. Sharp.*

5436. Markovits, Emmerich. **Zytologische Veränderungen von Paramaecium nach Bestrahlung mit Mesothorium.** [Cytological changes effected in Paramaecium through treatment with mesothorium (radium bromide).] Arch. Zellf. 16: 238–248. *Fig. 1–2, A-D.* 1922.—The author subjected individuals of pure lines of *Paramaecium caudatum* to the emanations from 10 mgm. of radium bromide, the alpha rays being eliminated and the beta and gamma rays being allowed to act. This resulted in a decrease in size and a generally increased rate of division in animals having recently undergone endomixis, but resulted in the death of those approaching or undergoing this reorganization. Cytological examination showed the division of the macronucleus to be unusually early, as well as abnormal in other ways, but the micronucleus remained seemingly unaffected.—*Ralph E. Cleland.*

5437. Mirande, Marcel. **Sur les organites élaborateurs particuliers (stérinoplastes) de l'épidermis des écailles de bulbes de lis blanc.** [On the special elaborating organs, the sterinoplasts, in the epidermis of the scales of the bulbs of the white lily.] Compt. Rend. Acad. Sci. Paris 176: 327–330. *Fig. 1–21.* 1923.—More or less spherical structures, composed of a central body surrounded by an outer layer or mantel, are found in these cells. They may give rise to a number of lobes, called calculs, which may have a crystalline structure. By boiling, the whole mass may become crystalline. Examination by means of intravital stains, boiling, and various chemicals shows that they are both protein and lipoid in composition.—*C. H. Farr.*

5438. Mirande, Marcel. **Sur la nature protéolipoidique des stérinoplastes du lis blanc.** [On the proteolipoidic nature of the sterinoplasts of the white lily.] Compt. Rend. Acad. Sci. Paris 176: 596–598. 1923.—The central body of the sterinoplast is found to be of lipoid composition. The covering is composed of an external layer of protein, an internal thicker layer of alternating concentric striae of protein and lipoid substances; next to the central body is a thin pellicule of proteolipoid material.—*C. H. Farr.*

5439. Mirande, Marcel. **Sur la nature de la sécrétion des stérinoplastes du lis blanc.** [On the nature of the secretion of the sterinoplasts of the white lily.] Compt. Rend. Acad. Sci. Paris 176: 769–771. 1923.—The chemical nature of the central body of the sterinoplast is further studied. It is now found to be composed of the lipoid, phytosterine. Various reactions of this substance, especially with heat, are discussed.—*C. H. Farr.*

5440. Nierenstein, M. **Tinctorial chemistry and histology.** [Rev. of: Becher, Siegfried. **Untersuchungen über Echtfärbung der Zellkerne mit künstlichen Beizenfarbstoffen und die Theorie des histologischen Färbeprozesses mit gelösten Lacken. (Investigations on nuclear stains and the theory of staining.)** *xx+318 p.* Gebrüder Borntraeger: Berlin, 1921.] Nature 110: 33. 1922.—The book is "certainly the best of its kind so far published."—*O. A. Stevens.*

5441. Noel, R. **Sur des phénomenes de condensation de corps gras à la surface des mitochondries.** [On the phenomenon of the condensation of fat bodies on the surface of mitochondria.] Compt. Rend. Acad. Sci. Paris 174: 572–573. 1922.—The material used was the liver of the white mouse. Figures are given in addition to the description, and there is an attempt to explain the phenomenon on the basis of colloids.—*C. H. Farr.*

5442. Overeem, Casper van. **Über Formen mit abweichender Chromosomenzahl bei Oenothera.** [Forms with varying chromosome numbers in Oenothera.] Beih. Bot. Centralbl. 1 Abt. 39: 1–80. *Pl. 1–15.* 1922.—A bibliography of 564 citations on the *Oenothera biennis* group, classified as to anatomy, cytology, systematic botany, etc., is given.—The relation between habit and chromosome number is discussed in triploid, lata, gigas, and forms developed from crosses. A particular form always has a definite number of chromosomes.—The origin of new elementary species in this genus is recognized in *O. bienniformis* and *O. de Vriesii.* —*L. Pace.*

5443. Puymaly, A. de. **Nouveau mode de division cellulaire chez les Conjuguées unicellulaires (Desmidiacées sensu lat.).** [**A new mode of cell division in the desmids.**] Compt. Rend. Acad. Sci. Paris **176**: 186–188. 1923.—A study was made of cell division in *Cylindrocystis crassa*, which has a mucilaginous envelope like that of *Gloeocapsa*. The daughter cells are included in the sheath of the mother cell, and the axes of the daughter cells are perpendicular to each other. In a clear equatorial zone the new transverse partition appears in the form of an annular diaphragm, the orifice of which gradually closes. The alga thus seems to have a primitive type of cell division.—*C. H. Farr.*

5444. Rappeport, Th. **Ueber die somatische Mitose des Menschen.** [**Somatic mitoses in man.**] Arch. Zellf. **16**: 371–382. *Pl. 18, 2 fig.* 1922.—The author reviews the literature and gives a table of the chromosome numbers obtained by the various investigators. A full account of the technique follows. The pleura, peritoneum, and amion were used on account of their flatness and the fact that they could be spread out thinly and studied without sectioning. The prophase and metaphase stages are described and figured. It was not possible to determine the chromosome number with absolute certainty, but it is unquestionably between 40 and 42 in somatic nuclei. Whether or not the number differs in the 2 sexes was not determined.—*Ralph E. Cleland.*

5445. Sands, Harold C. **Perigenesis.** Science **56**: 517–518. 1922.—A study of the division figures in *Tradescantia virginica* L., by the use of special methods of vital staining, shows that the chromosome structure is that of an achromatic cylinder with the chromatin imbedded in the form of chromomeres. There is no longitudinal splitting in vegetative or reduction divisions. Detailed publication is promised.—*C. J. Lyon.*

5446. Sugiyama, Takesi. **Studies of the structure and the nuclear division in a Japanese species of Opalina, O. japonica nov. sp.** Jour. Coll. Agric. Imp. Univ. Tokyo **6**: 361–390. *Pl. 40–42, fig. 1.* 1920.—This parasitic protozoan of *Rana* and *Bufo* is multinucleate and with the nuclei lacking a centrosome and a nucleole. The nuclei have 2 kinds of chromatin. The "vegetative" chromatin is comparable to the macronucleus of the higher Ciliata and the "generative" chromatin to the micronucleus. The nucleus is, therefore, considered to be in an undifferentiated primitive condition.—*G. M. Smith.*

5447. Taylor, W. R. **Organization of heterotypic chromosomes.** Science **56**: 635. 1922. —This brief note on the behavior of the heterotypic chromosomes of *Gasteria* "tends to demonstrate a very great precision in the chromomere constitution of the meiotic chromosomes."—*C. J. Lyon.*

5448. Tischler, Georg. **Allgemeine Pflanzenkaryologie.** [**General plant karyology.**] In: **Handbuch der Pflanzenanatomie.** Edited by K. Linsbauer. I Abt., 1 Teil: **Cytologie,** Band 2. *xiv + 899 p., 406 fig.* Borntraeger: Berlin, 1921–1922.—This is an exhaustive review of present knowledge of the plant nucleus. It is copiously illustrated and fully supplied with references to the literature listed in a bibliography of nearly 5,000 titles. The contents are indexed under authors, subjects, and plant classes and families. Following is a brief outline of the topics treated in the 11 chapters: (1) the resting nucleus and its external morphology; (2) the chemical organization of the resting nucleus; (3) the morphological structure of the resting nucleus; (4) the resting nucleus as a component of the living cell. Here are discussed: interchange between nucleus and cytoplasm; the relation of the nucleus to plastids, centrosomes, and blepharoplasts; movements of the nucleus and their physiological significance; the relation of the resting nucleus to cell division; multinucleate cells. (5) Typical nuclear division. This includes accounts of promitosis and mitosis in lower organisms, somatic mitosis in higher plants, the mechanism of mitosis, and the connection of mitosis with cell division. (6) Allotypic nuclear division. Chromosome reduction in plants is treated very fully. (7) Irregular mitoses and amitosis; (8) nuclear fusion. This deals chiefly with sexual fusion in the various plant groups, but includes also an account of vegetative fusions. (9) The chromo-

somes and their significance for investigations of race and inheritance. The number, size, form and arrangement of chromosomes, and the relation of their behavior to Mendelism and mutation, are fully treated. A list of all known chromosome numbers in plants, originally published by the author in 1915, has been brought up to date and included in this chapter, with references to all of the original papers. (10) Degeneration and resorption of the nucleus; (11) the question of the enucleate condition of certain organisms.—*L. W. Sharp.*

5449. Winge, Ö. **A peculiar mode of inheritance and its cytological explanation.** Compt. Rend. Trav. Lab. Carlsberg 14[17]: 1–10. *1 pl.* 1922.—In the fish *Lebistes reticulatus* there are several races of males with distinct color patterns, whereas all females are similar. Male offspring from a cross always have the identical color patterns of the male parent; back crosses between male F_1 and the female parent again yield male offspring similar to the male parent. Back cross F_1 females with unmarked males yields only unspotted males.—A condensed account is given of spermatogenesis to the production of spermatozoa and their discharge, and of oogenesis through the primary oocyte. The number of chromosomes is the same in both sexes, being 23 in the haploid phase. This is conceived to be a combination of 22 autosomes plus an X or a Y sex chromosome. The presence of Y determines the male sex, and secondary sexual characters carried by this body dominate the allelomorphs of the autosomes.—*F. Weiss.*

5450. Wylie, Robert B. **A note on the sperms of Vallisneria.** Science 56: 422–423. 1922.—In order to fix the sperms and ovules of *Vallisneria spiralis* it was necessary to squeeze the ovary contents out into water, which dissolved the mucilage about the ovules. Pieces of ice in this water cooled the ovary contents and slowed down the growth and cyclosis so that the fixing fluid could act on sperms in all situations through to the completion of fertilization. —The sperms travel down the pollen tube as male cells. The one that fuses with the egg flattens itself against the egg membrane. When the membrane is ruptured, the nucleus not only moves to the egg nucleus but there seems to be some mingling of cytoplasm.—*C. J. Lyon.*

ECOLOGY AND PLANT GEOGRAPHY

George D. Fuller, *Editor*

(See also in this issue Entries 5289, 5293, 5342, 5442, 5501, 5506, 5511, 5556, 5587, 5736, 5750, 5752, 5772, 5773, 5813, 5817, 5841, 5920, 5979, 5987, 6015, 6025, 6029, 6033, 6089, 6095, 6099, 6104, 6123, 6124)

GENERAL, FACTORS, MEASUREMENTS

5451. Anonymous. **Flora of New Zealand.** [Rev. of: Cockayne, L. **The vegetation of New Zealand.** In: Engler, A., und O. Drude. **Die Vegetation der Erde. Sammlung pflanzengeographischer Monographien. XIV.** *xxiii + 364 p., 65 pl., 2 maps.* W. Engleman: Leipzig, 1921.] Nature 111: 457–458. 1923.—The reviewer notes that the meteorological maps are quite deficient as to names and orographical details, the work being remarkably well accomplished otherwise.—*O. A. Stevens.*

5452. Bixby, Willard G. **Where may the northern pecan be expected to bear?** Amer. Nut Jour. 17: 78. 1922.—Pecans require about 150 "pecan growing heat units" (calculated by totaling the average monthly temperatures above 50°F. in 1 year). They do well even with 105 heat units.—*E. L. Overholser.*

5453. Boye-Petersen, J. **Om Lysets Indflydelse paa Algernes Fordeling i Havet og deres Farver. [On the influence of light on the distribution and colors of marine algae.]** Nat. Verden 7: 116–125. 1922.—A S. Ørsted outlined in 1844 the distribution of algae at different depths and sought the explanation in the changing colors of light transmitted through varying layers of water. In spite of further research the cause of this relation has not been determined. Engelmann may be right in his theory of the influence of different colors of light, but other factors, such as the light intensity, may also be of importance.—*Ernst Gram.*

5454. Braun-Blanquet, J., et J. Pavillard. **Vocabulaire de sociologie végétale.** [Vocabulary of plant sociology.] *16 p.* Montpellier, 1922.—This is an attempt to give in French with German equivalents a vocabulary of the accepted phytosociological terms used by the French and Swiss workers in this field. Among those used to denote the analytic characters of the species of plant communities are: abundance (l'abondance, Abundanz), the relative number of individuals; dominance (la dominance, Dekungsgrad, Arealprozent), the extent of surface occupied; distribution (la fréquence, Verteilungsart), the manner in which individuals are distributed in the population; sociability (la sociabilité, Geselligkeit), the disposition of individuals in the interior of an association; prosperity (la vitalité, Gedeihen), the completeness with which a species completes its cycle of development in a given population; periodicity (la périodicité), the seasonal duration; and dynamic behavior or genetic coefficient (comportement dynamique, bedingende Verhalten), the part played by the species in the development of the community. Different degrees of the various qualities are indicated numerically or, in the case of the last, by a set of conventional signs. The chief terms to denote synthetic characters are: constancy (la constance, Gesellschaftsstetigkeit), depending upon the number of sample areas of the association in which the species occurs; and fidelity or exclusiveness (la fidélité, Gesellschaftstreue), the degree to which the species is confined to the association. Five degrees of these 2 qualities are recognized. Other terms which have been more widely used and more commonly understood are also included. [See also Bot. Absts. 12, Entry 2999.]—*Geo. D. Fuller.*

5455. Dastur, R. H., and W. T. Saxton. **The oecology of some plant communities in the savannah formation.** Jour. Indian Bot. 3: 34–51. *2 pl.* 1922.—This study was made on an undisturbed area about 90 × 800 m. near Ahmedabad (India), 23° 2′ N. Lat., 73° 39′ E. Long. Beginning at one end, Area I is dominated by *Cassia auriculata*, with less *Zizyphus rotundifolia, Cenchrus biflorus,* and *Indigofera enneaphylla;* Area II is dominated by *Cassia auriculata;* Areas III and IV by *Saccharum Munja*, dominance being more marked in Area IV. Many other plants are present in smaller amounts.—In the attempt to determine the cause of this floristic variation in what appeared to be a uniform habitat, 4 lines of investigation were carried out: (1) Detailed analysis of the vegetation of the 4 areas. Tables are given of the percentage of each species in the areas. (2) Soil analyses. The soil is almost pure sand, with little humus. No significant chemical differences in the 4 areas was found. According to moisture content, the areas are arranged II (highest), I, III, IV (lowest), and this order is maintained at all seasons. Mechanical analysis by passing the soil through sieves of 30, 60, and 90 meshes to the inch proved inadequate, so a thoroughly mixed sample of the 90-mesh screenings from each area was spread evenly on a glass slide and microphotographed. The particles of various sizes in unit areas of the photographs were counted, and the percentage weight of each size calculated. The order of the areas on the basis of percentage weight of soil particles less than 0.15 mm. in diameter also is II, I, III, IV, and the conclusion is that water holding capacity of the soil, determined mainly by particles 0.15–0.05 mm. in diameter, is the principal cause of the floristic differences. (3) Physiological anatomy of some of the more important plants. Details are given of leaf and root structure of 7 plants. No satisfactory correlation could be found between anatomical features and distribution. (4) Study of root systems of dominant plants. Long straight unbranched tap roots predominate. They penetrate from about 1.4 m. in small plants like *Boerhaavia* and *Lepidagathis* to 5.5 m. or more in old plants of *Crotalaria Burhia.*—*Winfield Dudgeon.*

5456. Dodds, Clifford. **Further observations on the water hyacinth.** Monthly Bull. California Dept. Agric. 11: 759–760. 1922.—*Eichornia crassipes* Solms has proved an extremely dangerous and troublesome pest in southern U. S. A. and in the irrigated districts of northern Sinaloa, Mexico. It chokes streams and canals and fills in water holes. It has appeared near Centerville, Fresno, and should be exterminated before it gains too strong a foothold.—*E. L Overholser.*

5457. Evans, John W. **A Peruvian desert.** [Rev. of: Bosworth, T. O. **Geology of the Tertiary and Quaternary periods in the north-west of Peru.** With an account of the paleontology by H. Woods, T. W. Vaughan, J. A. Cushman, and others. *xxii* + *434 p.* MacMillan Co.: London, 1922.] Nature 111: 527–529. *2 fig.* 1923.—This book is regarded as a classic of the desert. Figure 2 shows a cactus, "Rabo de Leon," growing among quartzite blocks.—*O. A. Stevens.*

5458. Fisher, R. A. **Paradoxical rainfall data.** Nature 111: 465. 1923.—A table is given showing the monthly distribution in ½-inch intervals over a period of 70 years at Rothamstead. The variability is so great that the mean values give little indication as to which month should be expected to be wet or dry.—*O. A. Stevens.*

5459. Havermans, Aug. **Plaatselijke en kruidkunde.** [Local zoology and botany.] Natuurwetenschap. Tijdschr. 4: 234–241. 1922.—The writer confirms the statement of Caballera that *Chara foetida* makes water uninhabitable for mosquitoes of the genera *Culex* and *Anopheles*. Probably the plant secretes a toxin which is harmful to these insect larvae.—*J. C. Th. Uphof.*

5460. Martin, G. W. **Food of the oyster.** Bot. Gaz. 75: 143–169. *Fig. 1–9.* 1923.—Of the 3 sources of nutrition for oysters, small living organisms, organic detritus, and dissolved organic matter, the author treats only of the first 2. In the case of the Barnegat Bay (New Jersey) oysters studied, he finds diatoms to be less important than the nannoplankton. Of the latter, small flagellates and Peridineae are especially prominent. There obtains, however, an extreme variability in kind and amount of the food used from time to time due to changes in the available supply. Organisms washed to oyster beds from brackish ponds are important food elements. The author confirms, with reservations, the method of using the color and consistency of the gastric crystalline style as an indicator of the kind and amount of food taken. He finds some evidence to prove the rejection by the oyster of finely ground particles of the marsh grass *Spartina glabra* var. *pilosa*. It was found that the mucous discharges from the mouth region containing rejected living organisms tend to cling to the shell. Fecal matter is also added to the gelatinous content so that, as the writer puts it,"the oyster not only plants a garden but also fertilizes it." He was definitely able to show that the shell accumulations increased much more rapidly on the shells of living oysters than on shells which were filled with cement.—*B. W. Wells.*

5461. Pavillard, J. **Cinq ans de phytosociology.** [**Five years of phytosociology.**] *30 p.* Montpellier, 1922.—The origin of this branch of ecological science is seen in a publication by Harper in 1917; among those who have contributed to its advance Rübel, Tansley, Braun-Blanquet, and du Rietz are mentioned. It places emphasis on the study of the structure of plant communities and the inter-relations of their members. Attention is focused upon the vegetation and not upon the habitat. The developmental or dynamic principle is recognized as the essential one in the interpretation of plant communities and the association is the fundamental unit comparable to the species in taxonomy. Associations are to be recognized and characterized by the exclusiveness or affiliation (fidélité) of the species composing them and designated according to the dominance of the species.—In discussing the grouping of associations Pavillard thinks that a natural system may be evolved based upon the "sociological progression" of Braun-Blanquet but the time has not come, apparently, for the formulation of such a classification. As the highest unit in such a classification he recognizes the "element" as employed by Braun-Blanquet, that is, the autochthonous and permanent vegetation of a phytogeographical region. The formation, he holds, is not a unit of vegetation superior to the association but a plant community, of any size whatever, characterized by a homogeneous physiognomy, or in other words, the formation is the growth-form (ground-form) of the association.—*Geo. D. Fuller.*

5462. Saxton, W. T. **Mixed formations in time: a new concept in oecology.** Jour. Indian Bot. 3: 30–33. *1 diagr.* 1922.—The author concludes that European and American classifications of plant communities cannot be applied to the vegetation of peninsular India, at least not in ways hitherto attempted. It is customary to think of any given stable area as occupied by 1 formation only, although displaying different aspects and floristic composition at different times. Europe and America have no habitat which even approximately corresponds to the Indian monsoon habitat, with its succeeding 8 months of drought. During the year a given area is subjected to 2 or even 3 such widely differing sets of conditions as to practically amount to distinct habitats: (1) during the monsoon both soil and air are almost saturated with water for about 3 months, when comparatively delicate mesophytic plants flourish; (2) if subsoil drainage is imperfect, toward the end of this period the soil becomes completely water logged and swamp conditions arise; (3) at the end of the monsoon both soil and air gradually become dry, culminating in about 7 months of intense drought, when markedly xerophytic plants are met with. Such an area "may be supposed to be xerophytic bushland in the months of April and May, equally to be a meadow with scattered bushes in July and August, and possibly also to be a marsh in September and October." This is not "succession" in the usual sense. It is suggested that the area cannot be regarded as occupied by "a single unit ('formation') of vegetation, but rather that two (or even three) entirely different plant communities regularly alternate with one another, though each persists to some extent through the dominant phases of the other, thus giving rise to the idea of 'Mixed formations in time.'"—*Winfield Dudgeon.*

APPLIED ECOLOGY

5463. De Sellem, Geo. B. **Inspectors corner.** The Western Honey Bee 10: 16–19; 47–50; 79–82; 111–113; 143–145; 207–209; 239–241; 267–268; 299–301; 332–336; 365–371. 1922.—In this department the bee inspectors of California report briefly each month as to the condition of the honey plants in the different counties of the state.—*J. H. Lovell.*

5464. Sands, W. N. **The agricultural possibilities of Cameron's Highlands, Pahang.** Malayan Agric. Jour. 10: 269–280. 1922.—In the northwest of Pahang at an altitude of about 5,000 feet is a considerable area of open valley land now explored for the first time since its discovery by Cameron in 1885. Probably at least 2,000 acres could be used for the cultivation of *Cinchona* and tea, and other possible crops are suggested; some account is also given of the vegetation, soil, and climate. The Lubok Tamang district lies on the route to Cameron's Highlands at a mean altitude of 3,500 feet; about 500 acres suitable for tea and market garden crops are here available.—*R. E. Holttum.*

FLORISTICS

5465. Anonymous. **The flora of an Indian island.** [Rev. of: Annandale, N. **Introduction to the study of the fauna of an island in the Chilka Lake.** Mem. Asiatic Soc. Bengal 7: No. 4.] Nature 111: 378. 1923.

5466. F[yson], P. F. [Rev. of: Willis, J. C. **Age and area, a study in geographical distribution and origin of species.** *251 p.*, University Press: Cambridge, 1922.] Jour. Indian Bot. 3: 182–183. 1923. [See also Bot. Absts. 12, Entry 4851.]

5467. Harper, Roland M. **Some recent extensions of the known range of Pinus palustris.** Torreya 23: 49–51. 1923.—The range of the long-leaf pine has been extended in northwestern Alabama to Walker and Fayette counties, and in Mississippi to Newton County. —*J. C. Nelson.*

5468. Kashyap, Shiv Ram. **Notes on some foreign plants which have recently established themselves about Lahore.** Jour. Indian Bot. 3: 68–71. 1922.—The indigenous vegetation about Lahore (India) approaches that of a desert. Nineteen plants are recorded as recently established. A few have washed down to the plains from the Himalayas, but most have come from abroad, mainly from America.—*Winfield Dudgeon.*

5469. Nygaard, J. N. **Botaniske Resultater.** [Botanical results.] In: Koch, L. **Resultaterne af Jubilaeumsexpeditionen Nord om Gronland 1921.** [The results of the jubilee expedition north of Greenland 1921.] Nat. Verden 7: 74–76. 1923.—In this preliminary report of an expedition from Inglefield Gulf round Pearyland the author mentions his collections from Washington Land and Inglefield Land, of about 4,000 specimens, fossils and marine algae included. In Inglefield Land 2 localities gave each more than 100 species of higher plants, while Washington Land with its dry limestone has a very poor vegetation. Special mention is made of the distribution of *Salix herbacea* and *Hesperis Palasii*, and the occurrence of several species of *Taraxacum*.—*Ernst Gram.*

5470. Phillips, R. A. **Distribution of Brachypodium pinnatum in Ireland.** Irish Nat. 29: 75. 1920.—This grass was first recorded from Ireland in 1898. Now several new localities are given; "wherever it grows it is the dominant species, driving all other plants before it with its strong creeping stem."—*W. E. Praeger.*

5471. Stager, Rob. **Beitrag zur Verbreitungsbiologie der Claviceps-Sklerotien.** [Contribution to the biology of the dissemination of the Claviceps sclerotia.] Centralbl. Bakt. II Abt. 56: 329–339. *Fig. 1–2.* 1922.—The author points out some of the adaptations of Claviceps sclerotia to insure distribution. The sclerotia of the aquatic grasses have air chambers and consequently float. Those of the land grasses the seeds of which are provided with a pappus have somewhat reduced their specific weight; those of the grasses the caryopses of which are provided with awns or similar structures and depend on attachment for distribution have in no way lowered their specific weight.—*Anthony Berg.*

VEGETATION

5472. Anonymous. **Un bocage sur un bloc de pierre.** [A grove on a block of stone.] Nat. Canadien 48: 173–177. *1 fig.* 1921.—At "Pointe-aux Alouettes" between the confluence of the Saguenay and St. Lawrence is a block of rock with earth on it some 12 feet square carrying 3 birch and 2 Indian pear trees about 30 feet high the roots of which run into the earth beneath, as is well shown in the figure.—*A. H. MacKay.*

5473. Ashe, W. W. **Forest types of the Appalachians and White Mountains.** Jour. Elisha Mitchell Sci. Soc. 37: 183–198. 1922.—This paper treats specifically only the forest types of the Appalachian region. Those of the White Mountains are to appear in a later paper. More than 50 distinct forest types occur in the 2 regions. While the type is essentially permanent, oscillations and modifications occur by direct self-replacement under cover, by alternation, and by succession. For example, the chestnut type may with increase in peaty accumulation and greater acidity, become favorable for invasion by laurel. The types are separated by composition, by marked difference in height of dominant trees, and by the volume of wood. The sharpest transitions are due to differences in direction of slope and in abundance or scarcity of lime. In the Alleghanies, where stratification of rock is prevalent, the types are usually in horizontal zones along slopes and along ridges. For the Canadian life zone of the Appalachians 9 forest types are mentioned; for the transition zones 38 types; for the Carolinian area 9 types. The physiographic areas, with their associated forest types, are also tabulated. An appendix containing notes and references to literature is added.—*W. C. Coker.*

5474. Bertsch, Karl. **Pflanzengeographische Untersuchungen aus Oberschwaben.** [Studies on the plant geography of Upper Swabia.] Jahresh. Ver. Vaterländ. Naturk. Württemberg 74: 69–172. *20 fig.* 1918.—The 1st part discusses the numerous bogs of the region from the standpoint of floristics, ecology, physiography, and geology. The distribution of the characteristic bog plants of Swabia is given in great detail, including: *Vaccinium oxycoccus, Andromeda polifolia, Eriophorum vaginatum, Scheuchzeria palustris, Carex limosa, Melampyrum paludosum, Carex pauciflora, Trichophorum caespitosum, Lycopodium inundatum,* and *Malaxis paludosa.* Species from the bog-margins, treated in the same way, are: *Vaccinium uliginosum, V. vitis idaea, Carex cladorrhiza, C. helonastes, Lonicera caerulea, Viola palustris,*

and *Lysimachia thrysiflora*. In many cases the distribution is shown by means of maps, and the structure of certain bogs by diagrammatic plans and sections. The sedges considered in the 2nd part are *Carex alba* and *C. pilosa*, and evidence is cited to show that they entered Swabia shortly after the Ice Age. The carniverous plants discussed in the 3rd part include 3 species of *Drosera* (with 2 hybrids), 6 of *Utricularia* (with 1 hybrid,) and 2 of *Pinguicula*.—*A. W. Evans.*

5475. Brick, C. **Die Erhaltung von Mooren. [The preservation of peat bogs.]** Verhandl. Naturw. Ver. Hamburg. **25**: xvii-xx. 1917 [1918].—The structure and development of the various types of bog are described; also the draining and utilization of many bogs in Germany during the war. A plea is made for the preservation of some of the more characteristic and beautiful bogs as natural monuments.—*A. W. Evans.*

5476. Bruns, F. **Botanische Wanderungen in Nordpersien. [Botanical journeys in northern Persia.]** Verhandl. Naturw. Ver. Hamburg. **25**: xxvi. 1917 [1918].—The author, who visited Persia in 1909 and 1910, contrasts the vegetation of the southern coast of the Caspian Sea, the rainy provinces of Gilan and Masanderan, the mountainous region of the Elbur, and the xerophytic plateau to the southward.—*A. W. Evans.*

5477. Engel, Theodor. **Ein botanisches "Naturwunder." [A botanical "natural wonder."]** Jahresh. Ver. Vaterländ. Naturk. Württemberg **74**: 275–277. *1 fig.* 1918.—The author describes and figures a pollarded willow (*Salix alba*) in the crown of which a mountain ash (*Sorbus acuparia*) 2–3 m. high has established itself. The tree is growing in the vicinity of Eislingen, Germany. Attention is called also to the occurrence of the snowball and other woody plants in similar situations.—*A. W. Evans.*

5478. Harper, Roland M. **A botanical bonanza in Tuscaloosa County, Alabama.** Jour. Elisha Mitchell Sci. Soc. **37**: 153–160. *1 pl.* 1922.—The area studied includes the bluffs, cliffs, and ravines along the Warrior River, a short distance above Tuscaloosa, which is on the fall line. A remarkable assemblage is listed and discussed and the author compares the locality favorably with the celebrated bluffs of the Apalachicola in Florida. A number of the species find their southern limits here, and 1 (*Croomia pauciflora*) its northern limit. Among the most interesting plants found were: *Quercus Muhlenbergii, Q. montana, Acer leucoderme, Cladrastis lutea, Croton alabamensis, Neviusia alabamensis, Hypericum aureum, Heuchera macrorhiza, Dryopteris marginalis, Sedum Nevii, Viola canadensis, Asplenium Trichomanes, Dodecatheon Hugeri, Washingtonia longistylis.* The soil is strongly basic, containing 3.95 per cent of K_2O, though only 6.42 per cent of CaO. It is suggested that many supposed calciphiles are really potash-loving plants.—*W. C. Coker.*

5479. Uphof, J. C. Th. **Vegetationsbilder aus Kalifornien. [Vegetation pictures from California.]** Vegetationsbilder **14**: 1–24. *Pl. 37–42.* 1922.—A short description of the geography, topography, and climatic conditions of California is given together with the flora of the Sierra Nevada, the coastal region, the large valleys, the deserts, and the San Bernardino Mountains. The plates illustrate Yucca deserts, *Sarcodes sanguinea* in the Yosemite Valley, *Yucca* and *Ephedra* in the Mohave desert, *Eschscholtzia californica*, and *Neowashingtonia filifera* in Palm Canyon.—*J. C. Th. Uphof.*

STRUCTURE AND BEHAVIOR, SYMBIOSIS

5480. Bertsch, Karl. **Kalkliebende Pflanzen in Oberschwaben. [Calciphilous plants of Upper Swabia.]** Jahresh. Ver. Vaterländ. Naturk. Württemberg **78**: 55–67. *1 map.* 1922.—The author describes and indicates on the map the more important calciferous areas in Upper Swabia and gives an account of their geological history. He lists the plants under 3 categories: (1) those confined to calciferous habitats (33 species); (2) those strongly preferring such habitats and not found elsewhere in Upper Swabia (15 species); (3) those preferring calciferous habitats

but not absolutely confined to them (29 species). He then gives a detailed list of the calciferous areas and enumerates under each the calciphilous plants occurring there.—*A. W. Evans.*

5481. Dastur, R. H. **Vegetative reproduction by root runners in two species of Clerodendron.** Jour. Indian Bot. 3: 143–147. *2 fig.* 1923.—Healthy *C. infortunatum* L. and *C. fragrans* R. Br. plants propagate profusely from root runners growing about 10 cm. below the soil surface. The new plants are separated by progressive death of the old runners.—*Winfield Dudgeon.*

5482. Glück, H. **Systematische Zusammenstellung der Standortsformen von Wasser- und Sumpfgewächsen.** [Systematic summary of the growth-forms of water and swamp plants.] Beih. Bot. Centralbl. II Abt. 39: 289–398. 1923.—One pteridophyte family, Marsiliaceae, 12 families of monocotyledons, and 24 families of dicotyledons, including about 130 species, are described. The size of plant, leaf, etc., is described for each habitat, —water, land, submerged, floating, etc.—*L. Pace.*

5483. Iyengar, M. O. Tirunarayana. **On the biology of the flowers of Monochoria.** Jour. Indian Bot. Soc. 3: 170–173. *4 pl.* 1923.—*Monochoria hastaefolia* Presl. and *M. vaginalis* L., both common in India, show floral dimorphism related to cross pollination. The single fertile stamen bends either to the right or left, while the style bends in the opposite direction. Flowers of both types occur in the same inflorescence, but the flowers opening on any one day in an inflorescence usually are of the same type. Pollination is mainly by bees. Bagging experiments show that if cross pollination fails, self pollination can take place.—*Winfield Dudgeon.*

5484. Seifriz, William. **Observations on the cases of gregarious flowering in plants.** Amer. Jour. Bot. 10: 93–112. *1 pl.* 1923.—The author discusses drought as a factor in causing gregarious flowering in several species of bamboo and in the talipot palm, bringing together data from Jamaica, India, Ceylon, Java, and other regions in the tropics. He concludes that drought is not an important factor, although the remarkable flowering of talipot palms, 2 species of bamboo, and *Bauhinia anguina* at the same time in Ceylon during 1918 suggests the action of some environmental cause of which we are ignorant. Many of the bamboos have a long but very regular sexual cycle, at the close of which all individuals flower and die. Neither depletion of nourishment nor injury seems to be the cause of this cycle. The gregarious flowering of the orchid *Dendrobium crumenatum*, which is clearly caused by environmental factors, is described. The author briefly discusses the causes and origin of sexual periodicity and other growth rhythms.—*E. W. Sinnott.*

FOREST BOTANY AND FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 5473, 5849, 6027, 6084, 6095, 6109)

5485. Anonymous. **Annual return of statistics relating to forest administration in British India for the year 1920–21.** *29 p.* Calcutta, 1922.—This is the customary set of tables for all the British India states, covering the work of the Forest Department. The total area of forests is 250,473 square miles, or 23.1 per cent of total area of the provinces. The percentage of forest varies from 1.4 in Baluchistan to 64.3 in Burma and 70.2 in the Andamans. Artificially marked boundaries total 151,192 miles and forest settlements total 5,146 square miles. The forest survey maps now cover 88,511 square miles, 1,420 having been covered during the year. Working plans cover 59,584 square miles, or 23.8 per cent of forest area. Expenditures on communications and buildings totaled Rs. 33,55,747, in pursuance of the policy of developing the forest property. Forest offences totaled 83,300, the lowest number during the past 5 years. Fire protection was attempted on 44.2 per cent of area of reserves, and 5.6 per cent

of the attempted area burned over, the highest for 5 years, although the number of fires, 4,391, was well below the average. Practically ⅔ of the forest was open to all grazing animals for the entire year, and 12,159,000 head of stock were carried. The area of plantations increased by 1,600 acres to a total of 169,175 acres, of which 104,108 acres are taungyas. The outturn of timber and fuel was 298,654,000 cubic feet, the lowest for 5 years, while minor produce was of about average value at Rs. 1,36,00,627. The average cut per square mile was 1,192 cubic feet. About 15 per cent of timber and 8 per cent of fuel was removed by Government agency. Total revenue for the year is estimated at Rs. 5,41,00,000 and expenditures at Rs. 3,62,00,000. Fifty years ago the corresponding figures were Rs. 56,30,000 and Rs. 39,33,000, indicating the great growth both in scale of operations and in returns.—*S. B. Show.*

5486. Anonymous. **Bosques. [Forests.]** Agric. Mexicano y Hogar 39: 67–74. 1923.—A plea is made for the conservation of existing Mexican forests and for reforestation of the extensive denuded areas.—*John A. Stevenson.*

5487. Anonymous. **Commerce d'importation et d'exportation des bois en 1920. [Imports and exports of wood during 1920.]** Bull. Soc. Centrale Forest. Belgique 29: 628–636. 1922.—Although the years 1919 and 1920 marked such a peak of timber cutting that a special law was passed to stop the devastation, the Belgian timber imports for 1920 amounted to nearly half a billion francs in value. Tables compare imports and exports in 1913 and 1920, by classes of materials and by countries. Sweden has become the leading source of supply for Belgium, while France has become the leading purchaser.—*H. T. Gisborne.*

5488. Anonymous. **Conseil superieur des forêts. [Superior forest council.]** Bull. Soc. Centrale Forest. Belgique 29: 638–641, 680–688. 1922.—Accounts of the meetings of the Council on June 21, 1922 are given.—*H. T. Gisborne.*

5489. Anonymous. **Conseil superieur des forêts. Exploitation abusive des forêts particuliers. Interdiction. Reglementation. [Superior council of forests. Devastation of private forests. Control. Regulation.]** Bull. Soc. Centrale Forest. Belgique 28: 611–620. 1921.—Discussion and conclusions by the members of the council concerning the new law for controlling timber cutting on private holdings are reported. This concludes the discussion which has been published in previous numbers of this journal [see Bot. Absts. 11, Entry 3675; 12, Entry 3042].—*H. T. Gisborne.*

5490. Anonymous. **Experiences en pepinieres. [Nursery experiments.]** Bull. Soc. Centrale Forest. Belgique 29: 574–582. 1922.—Some results are given of experiments with the seed of *Pinus silvestris, Robinia pseudacacia,* and *Ulmus* sp. No indicative results were obtained by various methods of soaking the pine seed. No definite results have yet been obtained showing the effect of the vigor of the parent, although many old foresters believe that the stunted, or vigorous, condition of the parent is transmitted to the seedling. No definite results were obtained from experiments to determine the influence of age of the parent (15, 20, and 25-year-old parents were utilized).—*H. T. Gisborne.*

5491. Anonymous. **Experiences en pepinieres. [Nursery experiments.]** Bull. Soc. Centrale Forest. Belgique 29: 612–620. 1922.—Results are given of experiments in sowing seed of ash, hornbeam, linden, and cherry gathered from the tree at different dates in the fall. Some "general observations on the sowing of green seeds" are made, and the production of stump shoots, or sprouts, from maple is discussed.—*H. T. Gisborne.*

5492. Anonymous. **Loi portant nouvelle prorogation de la loi du 28 janvier 1921. [Law again prolonging the law of January 28, 1921.]** Bull. Soc. Centrale Forest. Belgique 29: 601–602. 1922.—The law of Jan. 28, 1921, authorizing the Government to oppose excessive exploitation of certain woods and forests in private ownership is prolonged in effect until December 31, 1923.—*H. T. Gisborne.*

5493. Anonymous. **Loi portant prorogation de la loi du 28 janvier 1921, autorisant provisoirement le Gouvernement à s'opposer à l'exploitation excessive de certains bois et de certaines forêts. [Law continuing the action of the law of January 28, 1921, authorizing the Government to oppose excessive exploitation in certain woods and forests.]** Bull. Soc. Centrale Forest. Belgique **28:** 610–611, 655–666. 1921.

5494. Anonymous. **Marche du bois. [The lumber market.]** Bull. Soc. Centrale Forest. Belgique 29: 688–691. 1922.—October and November, 1922, stumpage prices are given for various species and localities, according to size of trees. One oak tree of 260 cm. circumference and containing about 5 cubic m. brought the maximum price of 350 francs per cubic m. Scotch pine and spruce brought about 50 francs per cubic m.—*H. T. Gisborne.*

5495. Anonymous. **Personnalité civile de la Société. [Organization of the Society.]** Bull. Soc. Centrale Forest. Belgique 29: 676–679. 1922.—An account is given of a proposed change in the organization of the Belgian Forestry Society.—*H. T. Gisborne.*

5496. Anonymous. **Progress report of forest research work in India for the year 1920–21, including the administration report of the Forest Research Institute, Dehra Dun.** *1–84.* 1922.—The report covers the period July 1, 1920–March 31, 1921. Progress is being made in enlarging the Institute at Dehra Dun. Thirty-four plots were remeasured during the year by the Central Institute. Study of development of established sal reproduction continues to be an important project, and the work is being enlarged to include other valuable species. Artificial regeneration experiments with many species are under way. The work under charge of the various provincial silviculturists shows a wide range of experiments in both natural and artificial regeneration. Burning as an aid in establishing sal reproduction is being tested. Particular attention is being given to the evergreen forests of Assam where the valuable species are in the minority. Cutting and burning of the inferior species, and occasionally clearing and planting, offer best promise of success. In Madras work is under way on the difficult problem of establishing reproduction during the summer heat. In all provinces attention is being given to the remeasurement of permanent plots. In Burma much work in artificial regeneration of teak is under way. Under the heading of Forest Botany the work in group and strip regeneration of sal is described. Experiments indicate that a similar system will prove best for teak. A large amount of work in forest products is being undertaken, dealing with wood technology, testing, preservation, seasoning, minor products, paper, etc. Under Forest Zoology it is noted that relation between rainfall and prevalence of the sal borer is established. A systematic compilation of food plants of important insects is under way. Under Forest Chemistry the work deals with gums, oils, and oleo-resins. Better facilities are needed for publication of results. The administrative report for the Central Institute shows an expenditure for the 9 months of Rs. 2,71,996 compared to Rs. 2,16,270 for the entire preceding year.—*S. B. Show.*

5497. Anonymous. **Protection des oiseaux insectivores. [Protection of insectivorous birds.]** Bull. Soc. Centrale Forest. Belgique **28:** 650–655. 1921.—The text is given of a new law applying to the protection of 24 insect-eating birds.—*H. T. Gisborne.*

5498. Anonymous. **Report on the forest administration of the Bombay Presidency (including Sind) for the year 1919–20.** *131 p.* Bombay, 1921.—This is the usual administrative report covering all phases of the work of the Forest Department. The area is now 14,947 square miles, 24 less than the preceding year. Working plans continue in arrears, due to shortage of staff, and new plans are needed on 2,640 square miles and revision of old plans on 4,845. New roads to the amount of 181 miles were constructed, and Rs. 1,69,960 were spent on housing. The total of forest offences declined from 22,812 to 19,303, of which 2,271 were injury by fire. Fire protection was attempted on 11,195 square miles and was successful on 94.9 per cent, at an average cost of Rs. 5.9 per square mile. Incendiarism is the principal cause of fires. A total of 2,186,000 head of stock used the forests, compared to 2,674,150 the

previous year, the decrease being due to famine. Seed was generally satisfactory. The total area of plantations is now 39,352 acres, an increase of 4,220 acres. Cultural operations were carried out on 7,362 acres in the Northern Circle and on smaller areas elsewhere. The minor products are being used to an increasing extent. The total outturn of major produce was 1,179,000 cubic feet less than the previous year, due to the ending of the war, and lowered prices. The Government sawmill showed a profit. Thinning on 314 coupes realized a profit of about Rs. 9,000. Departmental exploitation produced 1,737,000 cubic feet of timber out of a total of 5,714,000, and 6,773,000 out of 39,040,000 cubic feet of fuel. The net revenue was Rs. 28,92,626, or Rs. 8,22,915 less than the preceding year. Considerable research work was done, largely in artificial regeneration. The increase in wages and shortage of labor due to the influenza epidemic greatly hampered operations. Capital investment in communications and improvements is evidently necessary both to increase the area worked and the revenue. The usual detailed tabular summaries of work are included.—*S. B. Show.*

5499. Anonymous. **Report of the forest administration in the Bombay Presidency (including Sind) for the year 1920–21.** *130 p.* Bombay, 1922.—The report is made to correspond with the fiscal year and covers a period of 9 months. The area of forests decreased by 17 square miles to a total of 14,929 square miles. Working plans are in force on 7,841 square miles, but revisions are needed on 4,614 square miles, and new plans for 2,177. Work is still hampered by lack of personnel. New construction was much less than the preceding year, only 59 compared to 181 miles of road having been built. Forest offences increased from 19,303 to 20,050, fire offences showing the largest increase. Fire protection was unsatisfactory, a total of 1,131 square miles or 10.6 per cent of total attempted area having burned over, due to the dry season and the hostility of the natives. One fire covered a distance of 15 miles and burned 60,000 acres in 24 hours. It is suggested that early burning is the only remedy for such occurrences. Animals grazed increased about 200,000 to a total of 2,388,500. In most of the forests the weather was unfavorable and seed and natural regeneration were poor. The usual cultural operations were carried out on cutting areas, such as weeding of seedlings, sowing of teak, and thinnings. Clear fellings were used in the Thana forests; elsewhere improvement fellings and unregulated cutting were the principal systems of management. Difficulties of labor and transport were serious and the total amount of timber cut was 4,803,000 cubic feet compared with 5,714,000 the previous year, while the figures for fuel are 35,108,000 and 39,041,000 cubic feet. Departmental exploitation accounted for about 25 per cent of the timber and 12 per cent of the fuel. Heavy capital investment is necessary to insure transportation facilities, since contractors and local transport are not dependable. Minor products such as sandal, paper pulp, resin, and tannin, were extracted from the forests to a value of Rs. 11,29,496. Financially, the year shows a decrease in net revenue of Rs. 11,86,460 from the previous year. Personnel is still inadequate for handling the work, and difficult season, famine, and political agitation made the year a particularly difficult one. The most serious trouble is the hostility of the people in many places.—*S. B. Show.*

5500. Anonymous. **Service des aménagements. Année 1921. [Forest management, year 1921.]** Bull. Soc. Centrale Forest. Belgique **29:** 586–588. 1922.—Eight tables are given showing the results accomplished in: (1) management plans revised; (2) extent of reserved areas; (3) conversion of ruined woods into coniferous and mixed forests; (4) conversion of coppice with standards into high forest; (5) conversion of simple coppice into coppice with standards and into high forest; (6) lengthening the rotation of coppice under standards; (7) lengthening the rotation of simple coppice; (8) reducing the period of return in broad-leaved forests.—*H. T. Gisborne.*

5501. Anonymous. **The forest formations of Western Australia: No. 1, the karri forest.** Australian Forest. Jour. **6:** 52–54. 1923.—The karri (*Eucalyptus diversicolor*) forests endemic to the extreme south and southwest of Western Australia are briefly discussed.—*C. F. Korstian.*

5502. Allen, E. T. **America's transition from old forests to new.** Amer. Forest. 29: 67–71, 106. *5 fig.* 1923.—Every forested country generally passes through 3 well-defined stages of economic development: (1) the wholly inconsiderate exploitation period, from which the U. S. A. has emerged; (2) the period, which the U. S. A. has entered, of alarm, conservation, and tentative experimentation with actual reconstruction methods; and (3) the final inevitable settling down into such fairly adequate forest production as comparative land values warrant, with the burden and benefit divided between public and private agencies according to their facilities and needs. To be continued.—*Chas. H. Otis.*

5503. Anderson, C. R. **Harvesting Christmas trees by topping.** Amer. Forest. 28: 731. *2 fig.* 1922.

5504. Baker, O. E. **Land utilization in the United States. Geographical aspects of the problem.** Geog. Rev. 13: 1–26. 1923.—This paper discusses in detail the present use of land, particularly for agriculture, the possibility of increasing the area of agricultural land and the yield per acre, and the present trend in land utilization and in agricultural production. At present no potential agricultural land is unutilized that does not involve unprofitable expense for reclamation or clearing. Considerable areas are not reverting to forest or pasture. Only about 40 per cent of the land area can ever be used for crops, and while the population is increasing rapidly the area of cultivated land is increasing but slowly. About 50 million acres of cutover lands can be turned into agricultural use, but at a high expense for clearing; and, moreover, most of this can be used more profitably for forest than for crops. It is stated that by ceasing to export agricultural products, by reclaiming all reclaimable land, and by increasing yields per acre, a population of 275 million could be provided for. Change in consumption from the present meat diet to one more completely vegetable in character would also solve the problem of an increased population. The present trend is toward a gradual increase in area of improved farm land with decrease of labor applied, and increased use of machinery and fertilizer. There is also an apparent trend toward more intensive use of the best lands, and use of poorer lands for grazing only. Increased importation of agricultural products probably will help to solve the problem.—*S. B. Show.*

5505. Balon, A. **Excursion forestière en 1920, seconde journée. [Second day of the 1920 forester's excursion.]** Bull. Soc. Centrale Forest. Belgique 28: 635–648. 1921.—The area of 4,248 hectares of the Hertogenwald is described as to its timber, management, soil, climate, altitude, topography, roads, game, improvements, exploitation, and nurseries.—*H. T. Gisborne.*

5506. Barbour, T., and W. S. Brooks. **The Sapo Mountains and the Sambu Valley: a biological reconnaissance in southeastern Panama.** Geog. Rev. 13: 211–222. 1923.—Forests of the region are discussed in connection with the human and animal life.—*S. B. Show.*

5507. Beeson, C. F. C. **Damage to timber by insects.** Indian Forest Rec. 9^5: 227–239. 1922.—In connection with seasoning of woods from Indian forest trees, it is pointed out that defects in manufactured forest products may have been due to damage to the tree prior to manufacture. Measures of seasoning adopted for one locality can not be applied to others because of the presence or absence locally of borers, while the season of felling or girdling influences materially the liability of a species to damage. Green conversion or removal of the bark from logs will permit damage from borers. The insect species which damage the wood are listed with a description of the damage caused; in many cases the woods involved are given.—*E. N. Munns.*

5508. B[iolle]y, H. **Eclaircie "par le haut" et éclaircie jardinatoire. [Thinning "from above" and selective thinning.]** Jour. Forest. Suisse 72: 181–186. 1921.—In certain forestry circles of Romanic Switzerland both terms are used indiscriminately to denote the same operation, thus causing confusion. Biolley objects to the misuse of terms and proceeds to

show that although the 2 methods of thinning may be analogous or even coincide at times, they necessarily differ in aim and subsequent progression. The method of thinning from above or the French method, as set forth and practised by Boppe, is compared point for point with the method of selective thinning, as defined by Gurnaud. The comparison is thus summarized: (1) thinning from above consists in the removal of competing trees (i.e., by liberation in a lateral direction) and tends to establish a shelterwood forest; (2) selective thinning consists in the removal of intermediate trees (i.e., by liberation in a lateral and downward direction) and tends to establish a selection forest. Biolley cites the results obtained by 2 foresters working under identical conditions and having apparently the same aim. Due to a difference in application of 4 successive thinnings one stand corresponds to a thinning from above and the other to a selective thinning.—*G. Kempff.*

5509. Biolley, H. **Réponse à Monsieur P. de Coulon. [Reply to P. de Coulon.]** Jour. Forest. Suisse 73: 49–52. 1922.—Biolley fails to see the exact point of de Coulon's criticism [see Bot. Absts. 12, Entry 5524] and therefore his reply is of a general nature. He proceeds to prove that he champions freedom of practice and individuality of the forester's art. The Méthode du Contrôle, the forest, and the best practice are to be considered hypothetical; consequently any method used must demonstrate its usefulness *a posteriori.* Although the method has proved successful in a practice extending over 30 years, Biolley states that it is not a panacea. It can be employed only in forests with special conditions, much depending upon the will and ability of the managing forester; it is a constant guide, not a hindrance, to a definite, unhampered practice. Several reasons are given why an ocular estimate, only, of the progress in a stand is misleading, concluding that the method is submitted in good faith as a successful experiment, although search for a more efficient method continues.—*G. Kempff.*

5510. Biolley, H. **Une expérience de communisme sûr la forêt. [An experiment in forest communism.]** Jour. Forest. Suisse 73: 61–65, 83–85. 1922.—The author turns to the history of communism in the forests of the canton of Neuchâtel, dating from the earliest colonization to the end of the 18th century. Under this social system the forests were considered "free for all," without restriction and without thought of their exhaustion. Late in the 14th century parties obtained leases of parts of the forest for their exclusive and unrestricted use. This custom extended until the communes in the canton became alarmed and restored the forests to "unrestricted free use." The misuse of forests continued until the first forest reserve of 30 hectares was set aside in 1567. This precedent was followed by other communes and thus the "absolute free use," handed down from generation to generation, was slowly broken down.—Through the efforts of the commune of Couvet, the entire canton decided in 1765 to abolish "unrestricted free use" and to encourage natural regeneration, in order to avert a timber famine. This step hastened the creation of forest reserves and their administration in the interest of the general public. Actual progress in the application of the new policy, however, was very slow, due to constant political interference on the one hand, and lack of a technically trained forest personnel on the other. It is pointed out that the present prosperous state of the canton is due to the abolition of forest communism.—*G. Kempff.*

5511. Bommer, Ch. **Les forêts de la region mediterraneene en France. [Forests of the Mediterranean region in France.]** Bull. Soc. Centrale Forest. Belgique 29: 545–556, 665–673. 1922.—A general description is given of the herbaceous and tree associations found in the French Mediterranean region with references to a few particular cases of succession and their controls.—*H. T. Gisborne.*

5512. Bradley, J. W. **A plantation of remarkable growth.** Indian Forest. 48: 637–640. *Pl. 18.* 1922.—To furnish fuel, a plantation of *Albizzia moluccana* was established in 1915, seed being sown 12 × 12 feet and the area interplanted. The average tree was 86 feet in height and had a girth of 2 feet 6½ inches, making 3,000 cubic feet per acre in 7 years. From this plantation 60 pounds of seed were collected and the return from thinnings, etc., amounted to Rs. 1,050, paying for the plantation with the major stand yet untouched.—*E. N. Munns.*

5513 Bradley, J. W. **Report on forest administration in the Andamans for the year 1920–21.** *ii + 42 p.* Calcutta, 1922.—This is the customary annual report of the work of the forest department, but covers only a 9 month period, since the forest and fiscal years are being made to coincide. The area of forests remains at 2,207 square miles, on 708 of which working plans are nominally in force. An attempt was made to substitute wood for coal as fuel, but with indifferent success. Improvements needed for forest purposes, such as roads and trams, were constructed, the total capital investment being Rs. 2,28,000. The area of plantations remains at 2,063 acres, and other cultural operations covered 2,112 acres. The species planted are chiefly teak, padauk, and mangrove. Thinnings were made in the earlier mangrove plantations, established in 1897. Clear cutting with artificial regeneration is now the silvicultural system in force. About 90 per cent of timber was extracted by Governmental agency, the total amount being 729,000 cubic feet. The usual confusion in current and capital expenditures makes a real understanding of the finances difficult. Apparently the Department is more than paying its way. The problem of labor is very difficult, as convict labor is to be abolished and free men are difficult to secure. Development of the forest property is seriously hampered, and a permanent population appears as the only solution. The usual detailed statistical summaries are given.—*S. B. Show.*

5514. Bruner, E. Murray. **Agricultura y silvicultura. [Agriculture and silviculture.]** Rev. Agric. Puerto Rico 6^6: 17–21. 1921.—The author emphasizes the importance of reforestation in Porto Rico, which is now largely denuded of forests and dependent upon imports for fuel and other forest products. Half of its area is waste land capable of being reforested.—*John A. Stevenson.*

5515. Bruner, E. Murray. **Ciertos elementos de la situación forestal como factores determinantes, en consideración del presupuesto del servicio forestal de Puerto Rico para los años fiscales 1921–23. [Certain elements of the forestry situation as determining factors in consideration of the estimates for the fiscal years 1921–23.]** Rev. Agric. Puerto Rico 6^4: 25–31. 1921.—The author reviews the past and present forestry situation in Porto Rico as a basis for outlining the needs of the forest service of the Island in the coming biennium.—*John A. Stevenson.*

5516. Bruner, E. Murray. **Informe del silvicultor. [Report of the silviculturist.]** Rev. Agric. Puerto Rico 6^3: 15–24. 1921.—The deforestation of Porto Rico has been going on for 4 centuries and 50 per cent of the land or over a million acres is now abandoned or affords only scanty pasturage. Such a condition emphasizes the need of forestry work on the Island. The Insular service now has under protection 15,000 cuerdas of mangrove swamp lands along the coast from which the crop is being sold as it becomes available. Other Insular forests are located near Guaynilla, Guanica, Maricao, and on Mona Island, totaling about 25,000 cuerdas. An experiment station has been established at Rio Piedras, including nurseries for tree production. The trees produced here will be used for planting on the Insular forests and along public roads.—*John A. Stevenson.*

5517. Bruner, E. Murray. **Informe sobre la situación de la silvicultura en Puerto Rico. [Report on the forestry situation in Porto Rico.]** Rev. Agric. Puerto Rico 8^6: 43–50. 1922.—The author discusses the present forestry situation in Porto Rico and the prospects for future development. Approximately ½ of the area of the Island is unsuited to agriculture and might well be put under forest growth.—*John A. Stevenson.*

5518. Bruner, E. Murray. **La extensión forestal en Puerto Rico una necesidad económica. [Forest extension in Porto Rico an economic necessity.]** Rev. Agric. Puerto Rico 9^5: 19–25. 1922.—Porto Rico has been practically denuded of forest growth, making artificial regeneration necessary. The author discusses the effect of forests on climate, soil, and stream flow. Considerable progress has been made by the Insular forest service in establishing nurseries, making planting plans, and in taking under management such remnants of forests as still exist.—*John A. Stevenson.*

5519. Butler, O. M. **Henry Ford's forest.** Amer. Forest. 28: 725–731. *7 fig.* 1922.—The author visited this forest of about 400,000 acres, located in the upper peninsula of Michigan, and recently acquired by Henry Ford. The most modern methods of lumbering are practiced.—*Chas. H. Otis.*

5520. Butler, O. M. **Our forest hunger.** Amer. Forest. 29: 3–13. *12 fig.* 1923.—This popular article depicts the ways in which forests and their products enter everyday affairs and activities.—*Chas. H. Otis.*

5521. Buyssens, Jules. **Forêt, nature et art. [Forest, nature and art.]** Bull. Soc. Centrale Forest. Belgique 29: 621–625. 1922.—The aesthetic value of a few trees is compared with that of an entire forest.—*H. T. Gisborne.*

5522. C. **La rouille vesiculaire du pin Weymouth. (Peridermium Strobi.) [Peridermium Strobi on the Weymouth pine.]** Bull. Soc. Centrale Forest. Belgique 28: 600–602. 1921.—*Peridermium Strobi*, which has become serious within the last 20 years in Belgium, threatens greatly to reduce or even to eliminate the growing of Weymouth pine. Five rules, formulated by Badoux, of the forest school at Zurich, are given for the proper handling of the species in order to reduce the danger of Peridermium infection.—*H. T. Gisborne.*

5523. C., N. I., et Cte. F. G. d'A. **Le prix des plantes en 1922. [The price of plants in 1922.]** Bull. Soc. Centrale Forest. Belgique 29: 567–574. 1922.—Nurserymen's prices for seedlings in 1922, some of which are given, are characterized as "exorbitant." Planting becomes a luxury available only to those who do not need to make a profit from the investment. These high prices are maintained by agreement or order of the nurserymen's syndicate, and great harm is bound to result.—*H. T. Gisborne.*

5524. Coulon, P. de. **Jardinage cultural ou Méthode du Contrôle. [Cultural selection or method of control.]** Jour. Forest. Suisse 73: 45–49. 1922.—Inventory revisions may be made as desired. The following specific provisions of the working plan are critically reviewed: (a) determination of thinning intervals; (b) establishment of thinning subdivisions; and (c) determination of the initial yield. The Méthode du Contrôle used by Biolley is regarded by de Coulon as of no practical use, except as a demonstration *a posteriori*. Field examinations are stressed as in every way superior to regulation by inventory figures. De Coulon states that his criticism is directed not against Biolley's praiseworthy book "Method of Control in Forest Management," nor against his practical demonstration of the Méthode du Contrôle during the last 30 years in the majority of the forests in the canton of Neuchâtel, but against the impression that cultural operations in selection forests depend upon the universal application of "methodic control." The article closes with an appeal for the preservation of the 300-year-old trees in the forests of the canton, the cutting of which is now threatened in consequence of the rigid application of the Méthode du Contrôle. [See also Bot. Absts. 12, Entry 5509.]—*G. Kempff.*

5525. Cox, Wm. T. **The fire call of the north woods.** Amer. Forest. 28: 707–711. *4 fig.* 1922.—This article pertains particularly to Minnesota. Reasons are given for the increased prevalence of forest fires. The greatest fire hazard came with the demand for drainage ditches, which have helped to dry out the swamps and grass lands. 252,000 acres of land burned over in the summer of 1922.—*Chas. H. Otis.*

5526. Dalrymple-Hay, R. **Report of the Forestry Commission [of New South Wales] for the year ended June 30, 1922.** *15 p.* Sydney, 1923.—This is the 6th annual report. Plantations of Monterey pine during the year amounted to 1,488 acres, much less than needed since importations of softwoods amounted in value to £1,478,000. On state forests, 33,975 acres were treated for regeneration and 10,920 acres were thinned. Over 204,000 railroad ties were supplied by state forests to the railway department. Forest fires burned 51,500

acres on a protected area of 850,000 acres. An additional 177,696 acres of state forests were proclaimed, bringing the total to 5,371,994. The area of timber reserves is 1,479,792 acres. New working plans were made for 152,324 acres, the total now being 1,027,361 acres. Timber converted amounted to 14,653 M board feet. The total revenue was £217,841 and administrative expenses £64,942. The consumption of native lumber in the State was 356,932 M board feet, and 145,646 M board feet were produced under license. The State was represented at the Australian forestry conference. Investigations of tanning materials and of native species for wood pulp were made.—*S. B. Show.*

5527. Delevoy, G. **Notes sur l'accroissement du hêtre dans la forêt de Soignes. [Notes on the growth of beech in the forest of Soignes.]** Bull. Soc. Centrale Forest. Belgique **28:** 579–599. 1921.—Beech is the most important broad-leaved forest tree in Belgium. Tables show volume growth; stand density and volume; mean tree measurements by decades up to an age of 120 years for one parcelle, and 160 years for another, with tree diagrams for each case. Growth is then discussed by height, diameter, longitudinal section, basal area, cubic volume, and form. A table of form coefficients is appended.—*H. T. Gisborne.*

5528. Dochnahl. **Ueber Band und Flechtweiden. [Concerning hoop- and basket-willows.]** Illus. Landw. Zeitg. **43:** 27. 1923.—This is a discussion of species and varieties of willow suitable for basket-making and for agricultural use in tying and braiding operations.—*John W. Roberts.*

5529. Ellis, Leon McIntosh. **New Zealand. State Forest Service. Report for the year ending March 31, 1922.** *25 p.* Wellington, New Zealand, 1922.—The report covers the 1st full year of operation of the Forest Service. A modern Forests Act became law, and though hampered by lack of technical force, good progress was made. The total area of state forests increased to 7,181,975 acres. The state plantations total 42,000 acres, and extensive areas have been planted by private owners. Fires burned over only 5,200 acres, the result of better protection and a favorable season. The inventory of forest resources is half completed. Expenditures were £107,582, of which £47,371 was for planting work; receipts increased to £30,836 in spite of a slump in the timber market. Great emphasis is being placed on public education in care with fire, tree planting, and the value of the forests. Research work is being undertaken aggressively, though with inadequate personnel. Economics, products, and the silvics and silviculture of important trees and forest types, as well as planting, are all under investigation. Experimental planting of sand dunes has been begun. Timber shortage is already evident in certain districts. Imports of timber continue heavy. Detailed tabulations covering the important features of work are appended.—*S. B. Show.*

5530. Farrington, H. A. **Annual progress report on forest administration in the Presidency of Bengal for the year 1919–20.** *50 p.* Calcutta, 1921.—The area of forests remained at 10,407 square miles, located on the fringes of the Province. Work was adversely affected by shortage of staff. One new working plan covering 27 square miles was put into effect and 4,805 square miles of forest are now under plan. Departures from the plans were necessitated by lack of demand and revision of plans. Good progress was made in housing, but little in construction of roads. The total number of forest offences dropped from 3,694 to 3,269, and convictions were obtained in 94 per cent of the cases. Fire protection was successful on 99.4 per cent of the 400,000 acres on which it was attempted. Sal fungus is under study, but definite conclusions can not be stated. Lantana is spreading rapidly and every effort is being made to eradicate it. Natural reproduction of the more valuable species is unsatisfactory, and present plans provide for artificial regeneration under the taungya system. With the cessation of war demands departmental operations decreased, but the total value of sales was Rs. 16,11,600 as against Rs. 14,69,200 the preceding year. The selection method is in force on 75 per cent of the area under working plan, and improvement fellings on most of the balance. The usual tending and cultural operations were carried out. The net revenue dropped from Rs. 11,21,800 to Rs. 9,47,600. Considerable research work was done, particu-

larly in connection with forest nurseries. A summary of the report by the Secretary to the Government is included, together with the usual detailed summaries of all phases of the year's work.—*S. B. Show.*

5531. Fricke. **Gedanken aus dem Walde und anderes. [Forest thoughts.]** Zeitschr. Forest.- u. Jagdw. 54: 43–54. 1922.—The agitation in favor of forest management under the continuous selection system has brought the high forest system with area regulation into disfavor. The most important factor determining increased yields under the new system is increased soil fertility through adequate protection; there is no reason why this can not be secured under the older system by cultural work, soil preparation, under-planting, etc. The high forest system is still in its infancy and needs improvement, but is capable of being improved. It is not economically desirable to abandon the system, prior to developing it to its fullest capacity; neither is it desirable not to develop the selection system, since only long-time development of each can furnish final conclusions. The author also discusses 2 problems in mensuration in the use of Schwappach's yield tables and Pressler's formula for calculating accretion.—*J. Roeser.*

5532. Georgi, C. D. V. **Note on Minyak Nyatoh (oil from Palaquium sp.).** Malayan Agric. Jour. 11: 38. 1923.—Particulars are given of this oil, probably from *Palaquium oblongifolium* Burck.; it is a hard white fat which could be used for edible purposes, soap-making, etc. —*R. E. Holttum.*

5533. Georgi C. D. V. **Notes on Kapayang oil.** Malayan Agric. Jour. 11: 39–40. 1923. —Oil from seeds of 2 forest trees locally known as Kapayang was examined. One of these is probably *Hodgsonia heteroclita*, the other not known. Neither has been cultivated and nothing can be reported as to commercial possibilities.—*R. E. Holttum.*

5534. Georgi C. D. V. **Oil from Sterculia sp.** Malayan Agric. Jour. 10: 259–261. 1922. —Analyses are given of oils from kernel and pulp of seed sent from Brunei, used locally as a source of edible oil. The total oil content is 26 per cent of the dry seed, but until larger quantities are available for investigation it cannot be recommended for any specific purpose.—*R. E. Holttum.*

5535. Gerry, Eloise. **Naval stores: treasures of the living pines.** Amer. Forest. 29: 72–77. *8 fig.* 1923.

5536. Ghose, T. P. **The calorific value of some Bombay and Burma timbers.** Indian Forest. 48: 141. 1922.—The heating values in calories and in B. T. U. calculated on wood dried at 100°C. are given for *Cordia myxa*, *Bauhinia variegata*, *Treme orientalis*, *Ficus tuberculata*, *Butea frondosa*, *Hymenodictyon obovatum*, *Zizyphus xylopyra*, *Polyalthia cerasoides*, *Bruguiera gymnorhiza*, *Ceriops roxburghiana*, *Cynometra ramiflora*, *Excaecaria agallocha*, *Heritiera minor*, and *Rhizophora mucronata*.—*E. N. Munns.*

5537. Grasset, L. **The timber industry in New Caledonia.** Australian Forest. Jour. 6: 40. 1923.

5538. Gray, E. **The cork tree.** Australian Forest. Jour. 6: 63. 1923.—Characteristics of cork oak (*Quercus suber*) and suggestions for planting it are given.—*C. F. Korstian.*

5539. Greeley, W. B. **Economic aspects of our timber supply.** Sci. Monthly 16: 352–361. 1923.

5540. Greeley, W. B. **Wood for the nation.** U. S. Dept. Agric. Yearbook 1920: 147–150. *4 illus.* 1921.—Arguments are presented for the growing of timber by farmers to help supply the increased demands made by industries upon our forests.—*C. J. Shirk.*

5541. Green, A. V. **Shelter belts and hedges at Rukura.** New Zealand Jour. Agric. 26: 133–139. *5 fig.* 1923.—Lists of plants which have proved satisfactory and suggestions for plants are given.—*N. J. Giddings.*

5542. Greenstreet V. R. **Ash from cutch manufacture as a fertilizer.** Malayan Agric. Jour. 10: 262–263. 1922.—Ash of the residue after tannin extraction from bark of mangrove trees contains 50 per cent lime and 9.6 per cent K_2O and may be of commercial value as a fertilizer.—*R. E. Holttum.*

5543. Griffith, Jean P. **El pino australiano. [The Australian pine.]** Rev. Agric. Puerto Rico 9[1]: 13–15. 1922.—The Australian pine (*Casuarina* spp.) has proved successful in Porto Rico under varying conditions of growth and increased plantings are recommended. —*John A. Stevenson.*

5544. Griffith-Boscowen, Arthur, and G. G. Leveson Gower. **The hundredth report of the commissioners of His Majesty's woods, forests and land revenues.** *55 p.* London, 1922.—This is the customary annual business report of the management of crown properties, and only incidentally deals with forestry. The income from timber for the year was £40,755, and disbursements on account of planting and preparation of timber for sale were £47,197.—*S. B. Show.*

5545. Guillaume, C. **La restauration des taillis degrades dans le Cantonnement de Beauraing. [The improvement of run-down coppice in the Cantonnement of Beauraing.]** Bull. Soc. Centrale Forest. Belgique 29: 556–567. 1922.—The following causes have resulted in a deterioration of the coppice: (1) grubbing out stumps; (2) pasturage; (3) short rotations; (4) soil moisture; (5) intemperate weather; (6) south exposures. The work of improvement consists of: (a) changing to coppice with standards; (b) introducing coniferous species in mixture; (c) conversion to pure coniferous stands. Tables are given showing the changes made and the results obtained. A few costs and selling prices are given.—*H. T. Gisborne.*

5546. Guillaume, C. **Les mélèzes du Gouverneur. [The Governor's larches.]** Bull. Soc. Centrale Forest. Belgique 28: 648–650. 1921.—A 60-hectare plantation of European larch is briefly described. The first plantation of about 100,000 seedlings, made 75 years ago, prospered well. Subsequent plantations of the same species on the same land have all failed more or less completely. The reasons are not yet understood.—*H. T. Gisborne.*

5547. Hansen, T. S. **Forest possibilities of northern Minnesota.** Amer. Forest. 28: 742–745, 757–758. *5 fig.* 1922.

5548. Harrington, C. L. **The trail ahead—how to put forestry in Wisconsin on a sound basis.** Amer. Forest. 28: 712–714. *4 fig.* 1922.

5549. Helouis et Hatiez. **Essais pratiques d'utilisation des bois de la Côte d'Ivoire. [Attempts to utilize in a practical way the timbers of the Ivory Coast.]** Rev. Bot. Appl. et Agric. Coloniale 2: 15–22. 1922.—The principal native woods are classified according to weight and density, and under these headings are given the native names, with brief notes on their physical properties and utilization. An appendix to the main article, written by Aug. Chevalier, gives a list of the botanical equivalents of these native names. These are as follows: *Alstonia congensis, Antiaris africana, Aucoumea klaineana, Baillonella toxisperma, Bridelia speciosa, Canarium occidentale, Chlorophora excelsa, Chrysophyllum* sp., *Cola nitida, Coula edulis, Dumoria Heckeli, Entandrophragma* sp., *Erythrophlaeum guineense, Fagara macrophylla, Funtumia africana, Guarea africana, Heritiera utilis, Khaya* spp., *Klainedoxa* sp., *Mitragyne macrophylla, Ochrocarpus africanus, Oldfieldia africana, Pachypodanthium Staudii, Petersia viridiflora, Protomegabaria stapfiana (Maesobotrya stapfiana), Pynaertia occidentalis, Rhizophora racemosa, Sarcocephalus esculentus, S. Pobeguini, Terminalia altissima, Trichilia Cedrata, Triplochiton scleroxylon, Uapaca benguelensis, Vitex pachyphylla.*—*Paul Russell.*

5550. Hill, C. L. **Fundamental principles underlying kiln drying.** Australian Forest. Jour. 6: 33–38. 1923.—This paper discusses the fundamental principles governing the removal of moisture from wood in kiln drying as studied at the Forest Products Laboratory of the U. S. Forest Service.—*C. F. Korstian.*

5551. Hvass, J. **Den af v. Kalitsch anvendte Skovbehandling, dens Fortrin og Mangler. [The forest management of v. Kalitsch, merits and disadvantages.]** K. Vet. og Landbohoejskoles Aarsskr. 1923: 165–192. *Fig. 1–8.* 1923.—A movement in German forestry from the old rigid system to more natural forms, where the forester merely helps nature, was studied in the "Dauerwald" of v. Kalitsch, in pine woods on diluvial sand in Anhalt. Since 1884 all clear cutting has been abolished, no litter is sold, and the poorest parts are even furnished with litter from other parts. The cutting was first very conservative tending to form trees with 10–14 m. branchless trunks and pointed crowns 6–7 m. high. When this was accomplished the new growth was allowed to appear in groups which, as the cutting proceeded, united to a remarkably regular cover in 20 years. In the Dauerwald the new growth in the shade of the older trees develops slender stems with thin branches and when the light is let in the crowns develop and the diameter growth speeds up. Objections to the Dauerwald are its lack of order and system, the great responsibility on the administrator, the poor guarantee for the future, the difficult and expensive work, and the great damage when the trees are cut.—*Ernst Gram.*

5552. Jacob, W. R. LeG. **Note on Bokain (Melia azedarach) plantations on Monabari tea estate.** Indian Forest. 49: 73–75. 1923.

5553. Jacob, W. R. LeG. **Note on Bokain (Melia azedarach) plantations on Orang tea estate.** Indian Forest. 49: 76–78. 1923.

5554. Jerram, M. R. K. **Cedrela serrata timber.** Indian Forest. 48: 501–502. 1922.—The wood is free from white ant depredations and offers excellent possibilities for use in white ant regions. The tree grows in moist localities, propagates readily from seed, and may be grown in dense stands on a 50-year rotation.—*E. N. Munns.*

5555. Jerram, M. R. K. **The effect of fire, shade, and injury on the growth of Pinus longifolia seedlings.** Indian Forest. 48: 644–647. *Pl. 20.* 1922.—Partial shade helped the growth of seedlings, while on the burns the tree made a much better growth than in the forest. Wood ashes apparently help, but the real effect is presumably deeper for the growth of trees in the nursery, fertilized with ashes, does not compare with their natural growth. An insect attacks the tree and after the death of the leader coppice growth forms a ring about the root, apparently changing the type of root growth from a fibrous system to a tap-root.—*E. N. Munns.*

5556. Kautz. **Die Verjüngung der Buche und Fichte im Harz. [The regeneration of beech (Fagus silvatica) and Norway spruce (Picea excelsa) in the Hartz Mountains.)** Zeitschr. Forst.- u. Jagdw. 54: 93-106. 1922.—The possibilities are discussed of securing natural reproduction under pure beech, pure spruce, and mixed stands with usual cutting methods. Mixed stands of beech and spruce are reproduced easily everywhere; beech in pure stands is easily regenerated when the soil is kept in good condition and free of weeds; and pure spruce stands may be regenerated in part naturally without cost; in part, only with cost; in part, only artificially. Beech regeneration is governed primarily by the degree of preparatory and light fellings, since the density of the overstory must be regulated according to the amount of light needed to induce seed production, to keep down advance reproduction, and to protect and encourage the desired reproduction. Spruce sites are classified according to method of reproduction to be used, and a few cultural rules are given. In any case—whether seeding or planting—extensive clear-cutting in spruce should be avoided.—*J. Roeser.*

5557. Kienitz. **Ergebnis der Versuchsanpflanzung von Kiefern verschiedener Herkunft in der Oberförsterei Chorin. [Results of experimental plantations of pines of various origin in the forest district of Chorin.]** Zeitschr. Forst.- u. Jagdw. 54: 65–93. 1922.—In 1907 Scotch pine (*Pinus silvestris*) seed from Scotland, East Prussia, southern France, Belgium, Bavaria (Rhine Palatinate), Courland, Brandenburg, and eastern Russia (Ural) was sown in the Chorin nursery. In 1908, 4 additional lots from Bulgaria, northern Sweden, and northern and western Hungary were sown. Results after 15 years are believed to be representative and reliable for practical application. Racial characteristics were developed during the first year after sowing, and the growth habit was affected by place of origin more than by any other factor. Results indicate that the southwestern German pine is entirely unadapted in the East, and southern German mountain pines do not thrive in northern Germany; that trees of eastern German origin surpass all other races in form and size; and that Belgian trees which showed the highest survival belong at least to the better races. On the basis of average height × survival, the different races of the 1907 planting ranked as follows: East Prussia, Belgium, Brandenburg, Courland, Rhine Palatinate, Scotland, eastern Russia, southern France. The last was a distinct failure. Of the 1908 sowing only the trees of northern Sweden showed promise. For the extensive introduction of pines extreme caution should be employed to select only such races as give the greatest assurance of developing good form upon the new site. In general, the local variety should be employed, and the use of seed far from its place of origin should depend upon similarity of site conditions. Since desirable forms are mainly heritable, stands should be so guided by proper selection in thinnings, that at maturity only those stems remain which conform to the object of management. For best results seed should be collected only from older stands, absolutely pure of race. Failures due to improper selection (from stands of poor form or from regions too remote from the place of employment) are very common and have discouraged pine culture in many parts of Europe —*J. Roeser.*

5558. Knuchel, H. **Quelques impressions sur le Portugal forestier. [Impressions of forestry conditions in Portugal.]** Jour. Forest. Suisse 73: 41–45, 65–68, 85–87. *3 pl., 1 fig.* 1922.—A general description of topography and climate is followed by a short description of Portuguese agriculture. Two tables show (1) the percentage of forest area compared with idle land and land to put to other uses, and (2) the distribution of the different forest types. The growing "Society of Tree Culture" plays an important political part. Portugal has an excellent basic forest law, enacted in 1901 and 1903 and enforced by a far sighted and conscientious forest personnel. All receipts of the forests on the public domain may be paid into a special fund to be used exclusively for forestry purposes other than salaries. The forests are classified according to whether their administration by the State is obligatory or optional. —The law of 1901 established a branch of forest management and one of forest research. An amendment in 1911 created a special fund for general forest inspection and the annual recognition of parish-schoolmasters of merit in any branch of forestry. Under the new forest laws great strides have been made by the State in land acquisition, afforestation, reforestation, road construction, and communal cooperation. The communes have themselves accomplished very little.—The distribution of forest species is summarized into the northern and southern groups. The characteristics, management, and utilization of maritime pine, the most important timber species, are briefly related. Other species are mentioned, especially cork oak.—An outline is given of the forestry organization headed by a director general and comprising the 4 offices of management and research, planting, administration, and finance. The extent of state forests including the areas planted in the mountains and along the coast is given.—The park at Bussaco, embracing 102 hectares, is not only of botanical interest to foresters, but also contains the only primeval forest of indigenous trees and shrubs left in Portugal. There are plantations of introduced species of *Abies*, *Picea*, and *Fagus*, a few splendid specimens of *Cupressus lusitanica* 270–300 years old and many of *Sequoia sempervirens*.—The State has been aggressive and successful in the afforestation of dunes and dried up marshes, obtaining good results especially with *Eucalyptus*, *Pinus maritima*, and *P. insignis*. To date, however, the State has not taken energetic steps in reforesting denuded mountain areas.—*G. Kempff.*

5559. Krauch, Hermann. **Nursery and planting methods developed at the Gallinas nursery, Santa Fe National Forest.** Nation. Nurseryman 31[5]: 125–128. *7 fig.* 1923.

5560. Leete, F. A., et al. **Report on forest administration in Burma for the year ending June 30, 1920.** *ii + 202 p.* Rangoon, 1922.—This is the usual annual report covering the activities of the Forest Department. A review of the more important phases of the work by the Chief Conservator is a feature. Rapid progress was made in reserving forests. At present only 29,874 square miles, or 20 per cent of the forest area, is reserved; the balance is unclassed. In the future, forests for local purposes as well as for timber will be reserved, a radical departure from past policy. Little was done in preparation of new working plans, though it is known that much is required and most existing plans are out of date. Minor species are not sufficiently recognized in the older plans. Natural reproduction was generally poor. Artificial reproduction has now covered 100,400 acres,—5,896 acres, largely teak, having been added during the year. Forest offences rose from 5,414 to 7,152, with the certainty that not all were reported. It seems probable that teak can be produced in a 60-year rotation by taungya regeneration as large as that grown in 180 years under natural conditions. Fire protection was attempted on 859,600 acres and 70,300 acres burned over during the year. Progress was made in construction of communications, but the province is still backward and exploitation is seriously hampered by lack of roads. The outturn of timber was 100,775,000 cubic feet, largely teak. Demand and prices were good. Minor produce rose in value to 11.26 lakhs and gross revenue was 165.67 lakhs,—36 lakhs more than the previous year. Departmental exploitation was commonly employed as in the past. A provincial research circle was created, and serious efforts were made to study the many forest species in the province. The usual detailed tabular summaries of receipts, expenditures, grazing, fire, exploitation, etc., are included.—*S. B. Show.*

5561. Leete, F. A., et al. **Report on forest administration in Burma for the period July 1, 1920, to March 31, 1921.** *202 p.* Rangoon, 1922.—This is the customary annual report dealing with all phases of the work of the Forest Department. A comprehensive review of important points by the Chief Conservator, and a summary by the Secretary to the Government are features. The reservation of forests for local use proceeded slowly due to both inadequacy of surveys and misguided opposition of the local population. It was found that many working plans are not being followed in practice, and while the need for new and revised plans is great, the tendency to regard all of the older plans as worthless is unfortunate. Greater attention was given to research, a special officer having been appointed, and much new work was undertaken. Taungya plantations, chiefly of teak, amounted to 5,500 acres in the year. This is an important method of regeneration, avoiding many of the difficulties of natural reproduction. An economic survey is proposed to determine the available supply of various timbers. Expenditures on communications and buildings totaled Rs. 2,33,354, and good progress in this work is reported. Breaches of forest rules totaled 6,140 for the 9 months. Fire protection was attempted on 445,870 acres, of which 116,007 acres burned. On the reserved forests 22,808 square miles were closed to grazing and 7,126 were open wholly or in part. The amount of teak cut was 322,660 tons, greater than in the entire preceding year, and 241,290 teak trees were girdled. The increased use of teak is regarded as dangerous because the present supply will decrease until plantations are ready to exploit. The total area of plantations is now 102,425 acres. Revenue and surplus continued to increase, being respectively 168 and 108½ lakhs as compared with 166 and 102½ lakhs the preceding full year. Teak is the backbone of forest revenue, accounting for 129 lakhs. The successful operation of the provincial forest school continued. The usual detailed tabular statements of the operation of the Department are included.—*S. B. Show.*

5562. Littlewood, A. C. **Effect of poisoning sandal seeds on germination.** Indian Forest. 48: 188–189. 1922.—Experiments on sandal seed show that neither perchloride of mercury nor the red oxide of mercury were effective rodent deterrents as the seed was freely taken. No treated seed germinated, but as no checks were made it is not known whether the seed was affected by the poisons.—*E. N. Munns.*

5563. Lovejoy, P. S. **Michigan's fight for forests.** Amer. Forest. 28: 749–753. *4 fig.* 1922.

5564. Lovejoy, P. S. **The need for a policy for the cutover lands of Michigan.** Rept. Michigan Acad. Sci. 22: 5–7. 1920.

5565. Milward, R. C. **Annual progress report on forest administration in the Presidency of Bengal for the year 1920–21.** *47 p.* Calcutta, 1921.—The report covers a 9-months period. The area under administration remained at 10,698 square miles, or 13 per cent of the area of the province. Working plans were revised for 46 square miles of forest. During the year 105 miles of new trails were constructed. Of 424,000 acres on which protection from fire was attempted, only 1.3 per cent burned. It was found necessary to fence plantations in order to prevent damage by wild cattle. Fungi and insects also required constant attention. Natural reproduction of desirable species continued unsatisfactory and much work was done in tending, cultivating, and protecting natural reproduction. Taungya plantations were established on 179 acres. Of the area under working plan 65 per cent has unregulated felling and 17.6 per cent improvement felling. Departmental operations accounted for 4 per cent of the timber and 22 per cent of the minor produce. The amount of sale and extraction was about the same as the previous year. A greater percentage of the expenditures was for capital investment, since it is recognized that greater investment in roads, communications, etc., is necessary if the forests are to be handled at maximum utility and profit. The net income for the period was Rs. 6,71,600, compared to Rs. 9,47,600 for the entire preceding year. A summary of the report by the Secretary to the Government is appended, with detailed tabulations of all phases of the Department's work.—*S. B. Show.*

5566. Möller. **Zusätze zur "Betriebsregelung im Dauerwalde." [Addendum to "Management regulation in the continuous forest."]** Zeitschr. Forst.- u. Jagdw. 54: 22–25. 1922.—Comments are made on Wendroth's article [see Bot. Absts. 12, Entry 5593]. Better knowledge is necessary of the quantity, increment, and value of the growing stock than is now had. The purpose of management in the continuous forest is to establish a definite, continuous, maximum yield, this to be secured gradually by means described by Wendroth. There is no fixed rotation under this silvicultural system, as the subject of management is not the stand but the individual tree. No thrifty growing trees are removed; if necessary, the growing stock is increased to take care of future needs; and the determination of the yearly cut must assure continuity of use.—*J. Roeser.*

5567. Moreillon, M. **Les forêts sont-elles vraiment protégées par les oiseaux? [Are the forests really protected by birds?]** Jour. Forest. Suisse 73: 81–82. 1922.—Birds are often quite impotent in checking sudden insect invasions and the author believes that they are not of such importance as nearly all who are interested in this question believe. He argues that birds are plentiful wherever they normally find an ample food supply, and *vice versa.* During the invasion in 1921 of *Dasychira pudibunda* into the forests in the vicinity of Count Berlepsch's "Station for Bird Protection," at Seebach, the forested bird sanctuary suffered very little; but if the birds are numerous there it is due to the fact that this forest is surrounded by meadows and fields, and that the "efficient protective organization" contributed to the result in an entirely secondary way.—*G. Kempff.*

5568. Perry, W. J. **Indian peeling in western yellow pine.** Amer. Forest. 29: 38. *1 fig.* 1923.—In northern New Mexico the Navajos and other Indians cultivated patches of corn along the lower valleys of the mountain streams. Also, a substitute breadstuff was prepared from the inner bark or cambium of pine trees. The outer bark was peeled with stone hatchets and the inner bark removed, dried, and roughly ground. The peeling was done in early summer. The operation did not seriously injure the trees, as a photograph of a tree three-fourths girdled in 1852 indicates.—*Chas. H. Otis.*

5569. Pinchot, Gifford. **Outlook for forestry in Pennsylvania.** Amer. Forest. 29: 19. *1 fig.* 1923.

5570. Pollet, J. **Le gibier et la forêt.** [Game and the forest.] Bull. Soc. Centrale Forest. Belgique 29: 603–612. 1922.—The ways in which abundance of game is favored or hindered through the practice of forestry are described; e.g., the present tendency toward large dense stands of spruce is highly unfavorable to deer; Scotch pine is better than spruce, and mixed stands are still better as they permit the growth of vegetation palatable to deer. By handling certain small areas in such a manner as to favor the various kinds of game the sport and profit of hunting can be maintained.—*H. T. Gisborne.*

5571. Preuss, Wilhelm. **Bäume als Blitzableiter.** [Trees as lightning conductors.] Illus. Landw. Zeitg. 42: 254–256. 1922.—Oak, linden, ash, and especially poplar suffer more frequently from lightning than do elm, birch, and beech. The writer gives reasons for believing the relative susceptibility of different genera is not due to differences in chemical content, location, soil, or root systems. Evidence is adduced to show that one species is as likely to be struck by lightning as another but that the trunks and large branches of poplars and oaks are damaged most often because their wood is more easily split. Many beeches are struck without perceptible injury. Smooth barked trees like beech are less easily injured than rough barked oak and poplar. Trees near buildings are not a lightning menace, but may be a protection as lightning conductors. Old, valuable, and favorite trees should be protected with lightning conductors.—*John W. Roberts.*

5572. R., E. **Le prix des bois.** [The price of wood.] Bull. Soc. Centrale Forest. Belgique 29: 625–627. 1922.—The price of wood, now high, has not yet reached its peak. Several lots of spruce at Eupen brought an average of 91.50 francs per cubic m. on the stump. Prices varied according to the size of the average tree. Prices are quoted for several other species at Bullange and Eupen.—*H. T. Gisborne.*

5573. Rau, Madyar Gopal, and John Lionel Simonson. **Oils and fats from the seeds of Indian forest trees. Parts 1–5.** Indian Forest Rec. 9[3]: 95–109. 1922.—A preliminary account is given of the yields, and chemical and physical properties of a number of new oils and fats extracted from native tree seeds. *Chloroxylon swietenia* seed yield 16 per cent of a non-drying oil of no present economic value. The seed of *Calophyllum wightianum* yields 34 per cent of an oil which is used as an illuminant. Seed from *Mimusops elengi* furnish 16 per cent oil which, unlike that of the African species of the genus, can not be used for culinary purposes. *Shorea robusta* seed yield 16.4 per cent of a fat resembling tallow; the percentage is too low for utilization. *Garcinia cambogia* seed yielded 31 per cent fat, which is edible and of possible economic importance.—*E. N. Munns.*

5574. Reginster, G. **Le dessouchement par explosifs. Les essais dans la forêt de Hertogenwald.** [Removing stumps by use of explosives. Experiments in the Hertogenwald.] Bull. Soc. Forest. Belgique 29: 582–585. 1922.—Detailed costs are given for an experiment in stumping land by use of explosives. No market was found for the material removed and the costs were deemed excessive.—*H. T. Gisborne.*

5575. Robertson, W. A. **Note on Gurjun or Kanyin.** Forest Bull. [Calcutta] 50. *7 p.* 1922.—This wood includes 6 species of *Dipterocarpus*, *D. turbinatus* and *D. alatus* being the most important. They occur in the evergreen forests of Assam, Burma, and the Andamans, tending to form pure patches. They are found principally at the lower elevations on dry sites. Trees 120 feet high and 10–15 feet in girth with 60–80 feet of clear length are not uncommon. The properties of the wood are described. It is not durable, but is extensively used for flooring and, when treated, for railway sleepers. A good oleo-resin is yielded. Data on costs of extraction in various localities are given. The present growing stock in Burma is estimated at 6 million tons, of which ¼ is of trees 9 feet or over in girth.—*S. B. Show.*

5576. Rodger, A. **Note on Thingan (Hopea odorata Roxb.).** Forest Bull. [Calcutta] 49. *15 p.* 1922.—The tree is found in Lower Burma and the Andamans, and has probably 8 varieties. It grows up to 150 feet high and 12 feet in girth with clear logs 40–80 feet in length. It is nowhere abundant. The properties of the wood are described. It is especially valuable for boat building, and in its range is regarded as one of the most valuable native species. The tree yields a resin, which is described in detail. The species reproduces readily, but seed can not be stored. It appears to do well even when growing under adverse conditions.—*S. B. Show.*

5577. Rodger, A. **Pinus Merkusii.** Indian Forest. 48: 502–504. *Pl. 13.* 1922.—The Merkusi pine is found in the upper valleys dividing Burma and Siam, usually on poor soils where it makes a fair growth. On good soils it is a tree of 36 inches diameter and 100 feet height at 100 years. Fire is very destructive to seedlings and reproduction is usually scanty. A heavy yield of resin is secured.—*E. N. Munns.*

5578. Schotte, Gunnar. **Redogörelse för Skogsförsöksanstaltens Verksamhet under Fyraårsperioden 1918–1921 Jämte Förslag till Arbetsprogram. [Report of the Swedish Forest Experiment Station for the 4-year period 1918–1921.]** Meddel. Statens Skogsförsöksanst. 19: 1–123. 1922.—The report gives a brief survey of organization, personnel, and expenditures, followed by discussions of the various lines of work. These discussions cover the field from the administrative rather than the technical point of view. The general program for the 4-year period 1922–1926 contemplates investigations under the following heads: (1) forest regeneration; (2) development of stands; (3) diseases and injuries; (4) races of trees and acclimatization of foreign trees in Sweden; (5) forest soils. Summaries of the program are given in German and English.—*G. A. Pearson.*

5579. Scott, A. H. **Massachusetts state forest from an old estate.** Amer. Forest. 29: 108–110. *7 fig.* 1923.—The Whitney estate in the Berkshire Hills, recently acquired as a part of the state forests of Massachusetts, is described.—*Chas. H. Otis.*

5580. Seaman, L. N. **Further report on tests of hammer handles made of Indian woods.** Indian Forest. 48: 543–547. 1922.—More complete data are given on laboratory tests of the static and impact bending of 3 Indian woods. [See also following entry.]—*E. N. Munns.*

5581. Seaman, L. N. **The suitability of certain Indian woods for hammer handles.** Indian Forest. 48: 175–181. *Pl. 10–11.* 1922.—Laboratory tests of the wood of *Terminalia tomentosa, Dalbergia sissoo,* and *Olea ferruginea* show that these supposedly inferior woods are suitable for handle stock. [See also preceding entry.]—*E. N. Munns.*

5582. Simonson, John Lionel, and Madyar Gopal Rau. **The constituents of some Indian essential oils. Parts 1–7.** Indian Forest Rec. 9^3: 111–146. 1922.—The essential oils from the oleoresin of *Pinus khasya* and *P. excelsa,* and the essential oils from *Cedrus deodora, Andropogon juarancusa,* and from the seeds of *Zanthoxylum alatum, Z. acanthapodium,* and *Z. budrunga* were obtained by distillation and subjected to chemical analysis. The methods employed are described. All of these oils are likely to prove of economic value. The resins from the pines are as good as those from the American *Pinus palustris.*—*E. N. Munns.*

5583. Smith, Herbert A. **How the public forests are handled.** U. S. Dept. Agric. Yearbook 1920: 309–329. *10 illus.* 1921.—The difficulties, duties, and aims involved in grazing, lumbering, and protection of public forests are presented in popular style.—*C. J. Shirk.*

5584. Smythies, E. A. **Calculation of the yield of a forest by formulae.** Indian Forest. 48: 626. 1922.—The standard formulae for yield fail under Indian conditions because of the species and sizes. A modified formula with a changed basis of volume to take care of both

the timber crop and the "small-wood" is worked out. V in the present case represents the volume of trees of age x and over with the proviso that both measurements and volumes per tree are taken to the same diameter, i.e., to the diameter of a crop or average tree of age x. In the United Provinces this diameter is invariably 8 inches, so that for any species or forest, as soon as the age of an 8 inch crop or average tree is known, the modified formula can be applied. The methods of deriving the formula are given in detail.—*E. N. Munns.*

5585. Smythies, E. A. **Distribution of age and diameter classes in a normal selection forest.** Indian Forest. 49: 66–69. *Pl. 4.* 1923.—The calculation for a stand of sal of second class quality is given, showing the normal distribution of the various diameter classes, and the volume of wood per acre in the different classes.—*E. N. Munns.*

5586. Th., J. **La preparation forestiere de la defense nationale. [Forestry preparation for the national defense.]** Bull. Soc. Centrale Forest. Belgique 29: 673–676. 1922.—The article deals with the role of forests in concealing the movements of troops, hindering the enemies' movements, and supplying needed materials. The restocking of certain areas is pointed out as urgently necessary for military purposes alone. Attention is called to the importance and value of the forest service personnel in time of war.—*H. T. Gisborne.*

5587. Tiemann, H. D. **The Australian bush.** Amer. Forest. 29: 87–90. *6 fig.* 1923.—Australia has less than 5 per cent of forested land and less than 2 per cent of merchantable timber. The predominant tree is *Eucalyptus*, with 283 species. Next in number of species come the wattles, or Acacias, of which there are at least 250. The forests as a whole are very deficient in softwoods. There are 11 indigenous genera of conifers. A most striking feature of the forests is the undergrowth of tree ferns, which are sometimes 25 feet in diameter and often several hundred years old. The mountain ash (*Eucalyptus regnans*) is probably the largest tree in Australia, one 347 feet high being reported in the Dandenong Mountains. A good stand of millable timber runs 30–50 thousand board feet per acre.—*Chas. H. Otis.*

5588. Todd, F. H. **Supplementary research report of Assam.** Indian Forest. 49: 69–73. 1923.—Of 752 square miles of forest surveyed, only 22 were in classes I and II. The balance is of doubtful economic value. Extensive planting is necessary to secure desirable stocking. Firewood timber is almost exhausted in some places. The supply of simul (*Bombax malabaricum*) for tea shooks is sufficient to fulfill the demand indefinitely.—*E. N. Munns.*

5589. Treskow, von. [Rev. of: Hedler, Walter. **Deutschlands Forst- und Nutzholzwirtschaft in und nach dem Weltkriege. [Germany's forest and timber management during and after the World War.)** *119 p.* Leipzig, 1921.] Zeitschr. Forst.- u. Jagdw. 54: 38–43. 1922.—Hedler was in charge of wood products under the War Department, and is well versed in the theory of forest politics. His book is valuable as a statistical reference. That portion, however, dealing with state control of wood prices, and of cutting and management upon private holdings can not go unchallenged by technical foresters. Hedler's idea regarding state control of forest product prices is impractical. He suggests state control of cutting and the utilization of Germany's forest reserve upon economic grounds, ignoring the fact that the forest reserve is too valuable to be used up during a temporary emergency. Socialization must be avoided, since the success of forest management has been mainly due to uninterrupted private endeavor. Only a little state help (e.g., a strict reforestation control on small holdings) is necessary in order to bring private forests to maximum production.—*J. Roeser.*

5590. Trotter, H. **Development of bamboos from natural seedlings. (Dendrocalamus strictus.)** Indian Forest. 48: 531–536. 1922.—In 11 years natural seedling bamboos formed clumps of exploitable size and required thinning. Largest culms are 40 feet in height and 5.5 inches in girth. The only protection given them was from grazing.—*E. N. Munns.*

5591. Vendelman, Henry. **Le pin de Banks.** [Pinus banksiana.] Bull. Soc. Centrale Forest. Belgique 28: 603–606. 1921.—*Pinus banksiana*, which was in great favor for many years in Belgium, is now being severely criticised. The present article is a defense of the species.—*H. T. Gisborne.*

5592. Wallace, H. C. **Forestry and our land problem.** Amer. Forest. 29: 14–18. *6 fig.* 1923.—Some ideas of the Secretary of Agriculture as to what should go into the U. S. A. forestry program are presented.—*Chas. H. Otis.*

5593. Wendroth. **Betriebsregelung im Dauerwalde.** [Management regulation in the continuous forest.] Zeitschr. Forst.- u. Jagdw. 54: 11–22. 1922.—The author describes and illustrates a plan of regulation based upon the Möller form of continuous management. Its object is to furnish at all times a survey of the growing stock and the increment of the stand and to provide for continuity of management. Regulation is by volume; governed by growing stock and increment; regulation by area in mixed stands can not be considered practicable or even possible. The working plan includes map and description of stand; tally of yearly cut by species, tally of yearly cultural and planting work and costs, and a statement of actual growing stock and increment for certain periods, the increment being calculated for 5 or 10-year periods in advance; and a tabulation of average diameters for calipered stands as an indication of the movements in value increment of the growing stock. Stands above 20 cm. in average diameter are actually calipered for volume; for those between 7 and 20 cm., volumes are computed from Schwappach's 1896 yield tables for pine.—*J. Roeser.*

5594. Wilbrand. **Nutzholzzucht.** [The production of timber.] Zeitschr. Forst.- u. Jagdw. 54: 175–180. 1922.—The author asks whether the present silvicultural systems are in harmony with the demand for maximum quantity and quality production. Long, straight-boled trees are demanded for the production of timber, and these are best secured by permitting trees to grow in pure, undisturbed stands until the completion of their natural height growth. When this age is reached thinnings should remove all material which touches or interferes with the crown development of the desirable timber-producing trees. At the same time an understory, preferably of red beech, should be introduced to secure full utilization of the site. Removals (thinnings or light cuttings) are to be made whenever necessary to keep the main stand absolutely free. This system applies to all the common hardwoods and softwoods and especially to ash and pine. By this method beech, heretofore managed for fuel wood production, is gradually being converted into a valuable timber tree. The important task for foresters is to determine the time when height growth ceases and diameter growth begins, by locating sample trees and securing measurements of merchantable length and total height. These will afford a basis for putting into effect this system of management.—*J. Roeser.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 5290, 5337, 5341, 5342, 5346, 5430, 5433, 5434, 5436, 5442, 5444, 5449, 5483, 5490, 5557, 5657, 5665, 5753, 6036)

5595. Anonymous. **Biometry and genetics.** Nature 111: 513–514. 1923.

5596. Anonymous. [German rev. of: Vilmorin, Jacques de. **Croisement entre pois à valves colorées et pois a valves vertes.** (Crosses between peas with colored pods and peas with green pods.) Compt. Rend. Acad. Sci. Paris 172: 815–817. 1921 (see Bot. Absts. 10, Entry 137). Zeitschr. Pflanzenzucht 8: 443. 1922.

5597. Baur. [German rev. of: Kaup, F. **Volkshygiene oder selektive Rassenhygiene?** (National hygiene or selective race hygiene?) *179 p.* Hirzel: Leipzig, 1922.] Arch Rass.- u. Ges. Biol. 14: 434–436. 1923.

5598. Bhatia, B. L. **On the significance of extra contractile vacuoles in Paramecium caudatum.** Jour. Roy. Microsc. Soc. London **1923**: 69–72. *3 fig.* 1923.—The presence of extra vacuoles is considered a case of reversion to an ancestral condition, in which there was a linear series of vacuoles.—*R. E. Cleland.*

5599. Blaringhem, L. **Hérédité des caractères physiologiques chez les hybrides d'Orges (deuxième génération).** [**Heredity of the physiological characters in the barley second generation hybrids.**] Compt. Rend. Acad. Sci. Paris **175**: 230–232. 1922.—Second generation hybrids between *Hordeum nudum* L. and *H. trifurcatum* Schlecht are found to inherit: 1. the awned and hooded characters in the ratio of 2.85:1–(123 hooded :49 awned); 2. The offspring produced both 2 and 6 rowed spikes and intermediates. The 123 hooded plants produced 48 2-rowed, 36 intermediate, and 39 6-rowed plants. The 49 awned plants produced 26 2-rowed, 6 intermediate, and 17 6-rowed plants. 3. The compactness of the spikelets and proliferations is found to be a complex situation which gives a wider "spread" in the 2nd generation than the original parents had. The conclusion reached is that ornamental and superficial characters (such as awns) are transmitted according to Mendel's law, but the physiological characters essential to increased production (such as fertility of the spikelets) are transmitted through a cellular structure which is a mosaic. The author believes that the selection of varieties for increased yield is quite different than the segregation of characters as conceived by the Neo-Mendelians.—*J. A. Faris.*

5600. Blaringhem, L. **Nouveaux faits relatifs aux hybrides de blés et d'aegilops.** [**New facts relative to wheat and aegilops**]. Compt. Rend. Acad. Sci. Paris **176**: 852–854. 1923.—During the seasons of 1919–1922 crosses were made between varieties of various species of wheat with the object of obtaining information on the fertility in rather wide crosses. Following are the results obtained: *Aegilops* × *Haynaldia villosa* gave no seed and the ovaries were not visibly affected; *Aegilops* × *Secale cereale* resulted in inflated ovaries but no seed was produced; *Aegilops ovata* × *Triticum spelta* gave inflated ovaries but no viable seed; *A. ovata* × *T. vulgare* resulted in 1 viable seed; *A. ovata* × Petanielle de Nice (a *T. vulgare* × *T. durum* hybrid) yielded 4 seeds; *A. ventricosa* × *T. spelta* produced 9 seeds; *A. ventricosa* × a monococcum × durum hybrid gave 13 seeds (all heads produced seed). Percentages of seed set are not given.—*J. B. Harrington.*

5601. Bluhm. [German rev. of: Kostitch, A. **Action de l'alcool sur les cellules seminales. (Action of alcohol on germ cells.)** Internat. Zeitschr. gegen Alkoholismus **1**: 53–70. 1922.] Zeitschr. Indukt. Abstamm.- u. Vererb. **30**:336. 1923.

5602. Bonnevie, Kristine. **Zur Analyse der Vererbungsfaktoren der Papillarmuster. [Analysis of the genetic factors of "finger prints."]** Hereditas **4**: 221–230. *5 fig.* 1923.—Considerable difficulty has been experienced in attempting to classify the various arrangements of papillary ridges revealed in ordinary finger prints, but fairly satisfactory results are obtained by giving each finger a numerical index determined by the number of ridges between the delta and the centrum and then assigning the individual a designation, his "quantitative value," based on the sum of the indices of all 10 digits. When the index numbers run from 0 to 10 the quantitative values have a possible range of from 0 to 100. An examination of about 200 subjects distributed among several families shows that when the individual quantitative values are plotted the resulting curve does not differ widely from the binomial curve, but a closer analysis shows that each person has his own peculiar "value" around which the values for his individual digits are grouped. Further, the two 0 individuals found were brothers, 2 with indices between 90 and 100 were related, and in other cases family resemblances were noted, particularly in the case of twins. Analysis of these family histories and of 24,518 additional individual records leads to the conclusion that the friction ridge pattern is conditioned by several, perhaps 5, pairs of hereditary factors.—*C. H. Danforth.*

5603. Brimhall, Dean R. **Family resemblances among American men of science. III. The influence of the nearness of kinship.** Amer. Nat. 57:137–152. 1923.—A study is reported of the relatives of individuals whose performances are of such an order that their life histories become of public interest. The brother of a man of science is twice as likely to be distinguished as the father; he attains eminence 4 times as often as an uncle, and 6 times as often as a cousin. Direct offspring are distinguished 3 times as frequently as nieces and nephews. Paternal and maternal influences have about the same weight in biological and—what might not have been suspected—in social inheritance as well.—*C. H. Danforth.*

5604. Clausen, J. **Stedmoderblomstens Variation.** [The variation of Viola.] Nat. Verden 7: 218–236. *Fig. 1–5.* 1923.—A popular extract is given of the author's paper in Botanisk Tidskr. [see Bot. Absts. 12, Entry 3147.]

5605. Clausen, R. E., and T. H. Goodspeed. **Inheritance in Nicotiana Tabacum. III. The occurrence of two natural periclinal chimeras.** Genetics 8: 97–105. *1 pl.* 1923.—The origin of 2 flower color bud variations in F_1 hybrids between varieties of *N. Tabacum* is described. In both cases the seed progeny of the normal and the variant were identical. In 1 case the variant type was propagated by cuttings, and root cuttings from such plants produced the normal type. The authors conclude that in both cases the variant type was a periclinal chimera consisting of an unchanged central cylinder enveloped in a mutated dermatogen.—*R. E. Clausen.*

5606. Correns, C. **Alkohol und Zahlenverhältnis der Geschlechter bei einer getrenntgeschlechtigen Pflanze.** [Alcohol and relative number of male and female plants with a dioecious plant.] Naturwissenschaften 10: 1049–1052. 1922.—Treating the pollen of *Melandrium* with alcohol vapor for periods of 40–60 minutes gave 15.92 per cent ± 1.72 more male plants than female than did the control where the pollen was untreated. In explanation of these results Correns thinks that there is a difference in the resistance of the male over the female determiners in that the latter are more easily injured by the treatment with alcohol.—*Orton L. Clark.*

5607. Dahlberg, Gunnar. **Twins and heredity.** Hereditas 4: 27–32. 1923.—Assuming that sex is determined at fertilization and the normal sex ratio is approximately 1:1, the number of twins which are of uniovular origin may be determined for any group of statistically adequate size by subtracting from the total number of pairs a value equal to twice the number of those in which the members are of different sex. This method, first employed by Weinberg, is essentially sound, and when applied in connection with adequate family pedigrees leads to the conclusion that there is an hereditary factor in uniovular as well as in biovular twinning. Weinberg had regarded the inheritance of uniovular twinning as unproved; many authors, not including Davenport, have regarded it as disproved. But an analysis of the previously reported data shows that uniovular twinning is probably more frequent among the relatives of uniovular twins than among other classes.—*C. H. Danforth.*

5608. Dilla, Harriette M. **Control of parenthood in relation to eugenics.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *267–271.* Williams & Wilkins Co.: Baltimore, 1923.—A discussion is presented largely in the form of questions, of negative and positive eugenics and birth control.—*Orland E. White.*

5609. Dudgeon, Winfield. [Rev. of: Schaffner, John H. **Control of the sexual state in Arisaema triphyllum and Arisaema Dracontium.** Amer. Jour. Bot. 9: 72–78. 1922. (see Bot. Absts. 11, Entry 4692).] Jour. Indian Bot. 3:120–121. 1922.

5610. Ellinger, Tage. **The variation and inheritance of milk characters.** Proc. Nation. Acad. Sci. [U. S. A.] 9: 111–116. 1923.—The writer has had the opportunity of studying the records of a large herd of Red Danish and Jersey cattle and their crosses. He finds that the length of the lactation period is almost wholly determined by the time of successful breeding

for the next calf and thus only slightly if at all by innate factors. He reaches the conclusion: "Taking every pro and contra into consideration, it is the conviction of the writer that the first 10-week section (2nd to 11th week) of the first lactation period best displays the genetic variations and therefore at present is the most reliable measure of a cow's milk yielding ability, though not an ideal one." Considerable differences were found between Jerseys and Red Danish in milk production, butterfat percentage (both with respect to average and to the curve of change during the lactation period) and butterfat production. As to inheritance he concludes: "There is no doubt that the mode of inheritance of milk characters falls in that group of inheritance phenomena to which the term blending has been assigned. The treatment of the material fails to disclose the action of any single Mendelian factor. There is no significant difference in the variability of the different genetic groups. The heterozygosity of the parental breeds and the probable complexity of the characters fully account for this."—*Sewall Wright.*

5611. F., E. **Comment transformer les carottes blanches en carottes rouges. [How to transform white carrots into red.]** Nat. Canadian 49: 58–60. 1922.—An attempt is made to indicate what has been done by cultivation and especially by selection. Reference is made to the work of Vilmorin, Joigneaux, Decaisue, and Labergerie—the last working on *Solanum commersoni.*—*A. H. MacKay.*

5612. Frimmel, F. **Notiz über Dominanzverhältnisse bei Fuchsienbastarden. [Note on dominance relations in Fuchsia hybrids.]** Indukt. Abstamm.- u. Vererb. 24: 279–281. 1920.—The hybrids between *Fuchsia corallina* and Molesworth, a form of the so-called *Fuchsia hybrida* Hort., were compared with the parents and the following resemblances noted: They resembled the *F. corallina* parent in having young shoots and petioles red, the veins of the leaf red on top, and the corolla violet. They resembled Molesworth in having hairy branches with a squarrose habit, veins green beneath, corolla double, and of same length. They were intermediate in 3 characters. The author proposes an unverified hypothesis to account for the veins of the hybrid resembling *F. corallina* in respect to the color of the upper surface and Molesworth in respect to the lower.—*L. L. Burlingame.*

5613. Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. [Handbook of agricultural plant breeding.]** Vol. 5. *2nd ed., x+272 p., 50 illus.* Paul Parey: Berlin, 1923.—In this volume the breeding of various plants is treated by different specialists, as follows: Oil palm, coconut, and date, Hubert Winkler; rice, J. E. van der Stok, L. Koch, C. Fruwirth; sweet potatoes, E. de Wildeman; sugar cane, peanut, cassava, J. E. van der Stok; citrus, Herbert J. Webber; tea, C. P. Cohen Stuart; coffee, J. S. Cramer, P. C. van der Wolk; cacao, cola, F. W. T. Hunger; olive, L. Trabut; castor bean, Orland E. White; cotton, Geo. F. Freeman; sisal, sorghums, millet, kapok, C. Fruwirth; *Hibiscus cannabinus, H. sabdariffa,* sesame, sunn-hemp (*Crotalaria juncea*), jute, (*Corchorus olitorius*), and *Corchorus capsularius,* A. Howard; *Cinchona,* C. Spruit. Rubber plants are discussed and miscellaneous notes given.—*C. V. Piper.*

5614. Gaines, E. F. **Genetics of bunt resistance in wheat.** Jour. Agric. Res. 23: 445–479. *3 pl., 2 fig.* 1923.—Crosses of resistant × resistant, resistant × susceptible, and susceptible × susceptible wheats were made and the F_3 generations tested for resistance to bunt (*Tilletia Tritici*) by inoculating the seed with the maximum spore load and planting in the field. The following conclusions were reached: (1) The most susceptible wheats produce about 80 per cent of bunted heads; the 20 per cent of sound heads seem to escape infection by accident. (2) Forty Fold, Red Russian, and Marquis varieties have dilute resistance which reduces the amount of bunt 20–25 per cent. When added together, as in descendants of crosses between them, a concentrated resistance with a value of 30–60 per cent is secured. Marquis wheat has a strong winter-sensitive resistance with a value of 50–60 per cent in spring-sown grain which is ineffective in preventing bunt when the seed is fall sown. (3) Turkey, Florence, and Alaska have differing concentrated resistance which reduces the amount of

bunt 70–75 per cent, compared with the standard susceptible varieties. These concentrated resistances are also cumulative in effect when brought together by crossing, the resulting descendants segregating into immune, very resistant, various stages of dilute resistant, and completely susceptible classes.—*J. A. Faris.*

5615. Harvey, F. H. **Egg-laying tests at Hawkesbury Agricultural College. Twenty-first year's results, 1922–23.** Agric. Gaz. New South Wales 34: 357–368. *3 pl.* 1923.—Egg production and weight of eggs are given for various breeds.—*L. R. Waldron.*

5616. Howe, Lucien. **Inheritance of eye defects.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *191–194.* Williams & Wilkins Co.: Baltimore, 1923.—Inherited eye defects are discussed. Guyer's recent work on rabbits is reviewed in detail.—*Orland E. White.*

5617. Kammerer, Paul. **Breeding experiments on the inheritance of acquired characters.** Nature 111: 637–640. 1923.—This article refers to *Salamandra, Alytes* and *Ciona.*—*O. A. Stevens.*

5618. Kiese, H. **Blütenveränderungen an Rosen. [Flower changes in roses.]** Möllers Deutsch. Gärt. Zeitg. 38: 101. 1923.—A Marechal Niel rose was cut back closely. Strong shoots were developed which in the 1st year produced glaucous (meergrüne) roses. When budded they produced, however, the normal yellow flowers. A strong twig of Perle des Jardins produced apically a flower stalk with stamens only. This was budded and showed reversion to the normal flower. The same sports may occur on certain varieties in different situations, as is the case with Souvenir d'un Ami. The light yellow sport of Franziska Krüger, under the name of Blumenschmidt, originated in the nursery of Kiese in Vieselbach-Erfurt and was also found in a nursery in Baden-Baden.—*J. C. Th. Uphof.*

5619. Kimball, Sarah L. **The Mayflower pilgrims.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *329–339.* Williams & Wilkins Co.: Baltimore, 1923.—A list of the Mayflower Pilgrims and a partial list of Americans eminent in government, law and literature who are descended from the Pilgrims are given in support of the author's thesis that this foundation stock was of great eugenic value and that it has determined the character of national development in the United States.—*L. C. Dunn.*

5620. La Rue, Carl D. **Notes on bud sport of Hibiscus mutabilis L.** Papers Michigan Acad. Sci. Arts and Letters 1: 151–154. 1923.—Cuttings from the double-flowered variety *alba* were grown under the author's supervision. One of these plants produced 1 branch with flowers pink, like those of the double-flowered variety *rosea.* Two plants from cuttings from the "sporting" branch had flowers all pink; these plants and the parent branch grew more slowly than *alba.* Among 161 plants from cuttings from the normal (*alba*) part of the original bush, 1 had pink flowers on 1 branch; another had pink flowers on a sector including about $\frac{1}{3}$ of 1 branch; and a 3rd plant had green leaves on 1 portion, yellow leaves on another portion, and leaves with irregular mottled variegation (green, yellow and yellow-green) on the rest. No crosses were made, because of lack of viable pollen.—*Howard B. Frost.*

5621. Lembke, H. **Ergebnisse neunjähriger Futterpflanzenzüchtung. [Results of 9 years of forage plant breeding.]** Beitr. Pflanzenzucht 6: 45–56. 1922.—The author reports on selection work with English, French and Italian rye grass and presents graphs showing the variations in yield for 18 selections over a period of 5 years, 1912–16. Selected plants were first increased vegetatively by dividing each plant into 25 units and setting these out in beds 4 sq. m. in area. Notes were taken on permanence, yield, leaf number, spike form, resistance to rust, and growth progress and the seed harvested from each plot were seeded in beds 20 sq. m. in area for further increase. No crossing was done. Red clover was selected for hardiness, the original selections being a few plants that survived the severe winters of 1911–12. The remarks on red clover selection are of a general nature.—*A. J. Pieters.*

5622. Lenz, Fritz. Erfahrungen über Erblichkeit und Entartung an Schmetterlingen. [Experiments upon inheritance and degeneration in butterflies.] Arch. Rass.- u. Ges.-Biol. 15:249–301. *1 pl.* 1922.—Degeneration is defined as due solely to changes in hereditary constitution (idiokinesis) and to selection. Kaup's statement that the hunger blockade and subsequent scarcity of food in Germany have had an extraordinary degenerative effect upon human stock is questioned. Past experience contradicts it. Dwarf races were formerly attributed to defective feeding, but now to the selection of small biotypes better capable of withstanding famine. Pictet's numerous experiments upon caterpillars fed upon different kinds of leaves are criticised. The alleged changes due to food are merely hereditary differences brought to light by inbreeding or by natural selection under crowded conditions of breeding. The author fed the 2 parts of a wild brood of *Lymantria dispar* with willow and with oak (normal food); the former first gave more moths with pure white ground color and prominent black stripes, the latter a larger proportion with yellowish ground color and faint stripes. Progeny of a pair from each lot were fed in 2 groups, 1 on oak, 1 on willow. In neither brood were willow-fed sibs distinguishable from oak-fed, but each strain showed the hereditary peculiarities of its parent strongly emphasized. Numerical averages obtained by classifying the specimens into 3 groups as regards ground color and cross bands support the conclusion that differences in nourishment with oak or willow produce no essential change in coloration. The differences observed at first were due to chance "selection" of biotypes from a heterozygous wild brood.—A numerical study of average wing-length of the oak- and willow-fed broods shows that the German variety thrives better on oak than on willow, var. *japonica* better on willow (foods naturally preferred), but lends no support to Pictet's statements that willow-feeding modifies *L. dispar* toward *japonica* and that each after 1 generation becomes adapted to its new food. Variation depends little on food but much on sorting out of biotypes. The male is not more variable than the female as Pictet claimed; index of variability of the male is 4.0, of female, 4.8.—Feeding caterpillars on Norway spruce (*Picea excelsa* contrary to Pictet, produced no definite changes in coloration, though it was not eaten readily and growth was checked by it. The 2nd generation fed on spruce did not differ from the 1st, except that the individuals were slightly smaller, due possibly to inbreeding but probably to the cooler summer (1921), which affected likewise oak-fed caterpillars. Spruce-feeding reduced the number of eggs laid from 800–1,000 to a few dozen, due to under nourishment. Death rate was high and breeding difficult, but this is not genuine degeneration. Pictet's claim that the offspring of parents raised on spruce adapted themselves more readily than their parents to the abnormal food (inheritance of an acquired character) is not supported by Lenz' observations; the difficulty in adaptation and mortality was about the same. Hybrid caterpillars of *Smerinthus ocellatus* ♀ (food-plant willow or poplar) × *S. tiliae* ♂ (food-plant linden) were fed in 2 lots, 1 on willow, 1 on linden; more survived on willow than on linden. Two broods studied differed widely in caterpillar color, but the 2 lots of each fed respectively on willow and on linden did not differ from each other. Nor were differences observed in hybrids of *Drepanula curvatula* ♂ and *D. falcataria* ♀ when the larvae were fed on alder and on birch, the former species normally feeding exclusively on alder.—Lenz confirms Goldschmidt's observations that a German *dispar* ♂ × *japonica* ♀ gives normal ♀♀ and all ♂♂ of a uniform grade of intersexuality. F_2 gave likewise normal females (112) and 99 males, 19 of which were normal, the rest intersexual in various degrees as shown by their checked appearance, 56 slightly, 24 strongly checked (with white) or mainly white, the last being degenerate with crumpled wings, due to the inequality in development of the white female and brownish-gray male areas, and incapable of reproduction. He adopts Goldschmidt's view that these signs of femaleness in the intersexual male are plasmatic effects due to the action of the female-determining (Y) chromosome of the *japonica* mother. But, possibly, sex-determination in the gypsy moth depends upon several (polymeric) sex-linked factors, which in the male may be interchanged between the 2 X chromosomes.—Back-crossing of females from broods in which intersexes occur with males of the "weak" race (*dispar*) increases the proportion of intersexes among the male offspring and also the grade of intersexuality toward femaleness. A large majority of broods that descended in an unbroken female line (and no others) from the original pair produced intersexes, though several gave only normal males

and females. German *dispar* females by intersexual males gave only normal offspring.—The genetic analysis of this case is not perfectly satisfactory to the author, but he does not accept Goldschmidt's hypothesis that genes fluctuate quantitatively. The process of Mendelian segregation would be likely to equalize supposed initial quantitative differences. Polymeric sex-determining genes and their exchange between the 2 X-chromosomes seems more reasonable than "fluctuation." Objections are raised to Goldschmidt's hypothesis that an intersex develops 1 sex until it reaches a "turning-point," when sex-reversal occurs. Mosaic contiguity of parts of unlike sex is due to simultaneous spacial development, not to a temporal succession of 2 antagonistic processes. Analogy, at least, suggests that the crossing of widely different races of men is a contributing cause of those phenomena of degeneration that appears so extensively in our very much mixed population.—*J. H. Gerould.*

5623. Loeb, Leo. **Disease and heredity.** Sci. Monthly **16**: 574–587. 1923.—From the hereditary standpoint there are 3 classes of diseases: those due to environmental factors, those due to altered constitution of the germ plasm, and those due to cooperation of altered germ plasm and environmental conditions. Several diseases are discussed as to their relation to these classes. The author is not in favor of beginning the weeding out process now; with the present imperfect knowledge it might lead to the destruction of some of the finer qualities and thus emphasize undesirable characteristics.—*L. Pace.*

5624. Lotsy, J. P. **A peculiar eye-color among Malamute-dogs.** Genetica **5**: 77–78. 1923.—The writer discusses briefly the variation which he observed among some 30 Malamute dogs at a "Polar Animal Show" at a seaside resort near San Francisco. These dogs are said to be the result of interbreeding dog-wolf hybrids. The writer was especially struck by the frequent occurrence of asymmetry in the eyes. In 87 of the dogs, one of the eyes was wholly gray or gray in a sector, the other brown. One dog had both eyes gray. He believes that dog-wolf hybrids would repay careful study.—*Sewall Wright.*

5625. Lundborg, H. **Racial structure of the Finns of the northernmost part of Sweden.** Hereditas **4**: 125–132. *4 fig.* 1923.—A study is reported of the racial constitution of Norrbotten, inhabited by 3 stocks,—Nordic, Finnic, and Lappic. Eye color, cephalic index, and facial index are considered. In the case of eye color typical Nordic and Finnic subjects have light eyes while Lappic subjects are dark. By counting the number of brown eyed individuals and adding to this a number equal to 50 per cent of those with mixed eyes (heterozygotes) the proportion of eye color determiners of Lappic origin may be estimated. Treating each of the 3 traits in this way, fairly consistent results are obtained. These investigations, which are still in progress, indicate that the Nordic race is about as strongly represented among the Finnish-speaking inhabitants of Norrbotten as is the Lappic, the 2 together equaling about 60 per cent. This may explain differences which have been noticed between "Finns" of Sweden and those of Finland. Philology would have been of little assistance in such a study. —*C. H. Danforth.*

5626. Mann, Margaret C. **The occurrence and hereditary behavior of two new dominant mutations in an inbred strain of Drosophila melanogaster.** Jour. Genetics **8**: 27–36. 1923. —In a stock of *Drosophila melanogaster* maintained by a single pair, brother-sister matings, two dominant second chromosome mutants appeared. This could not have occurred if all hereditary variation were the result of recombination or segregation of unchanged genes. Notched wings (N_2) is variable in expression and only appears during the first two days of hatching. The gene for multiplied lateral bristles (*Br*) is at locus 19. Both N_2 and *Br* are compulsory heterozygotes.—*Margaret C. Mann.*

5627. McCormick, A. C. **Blight resistance in pear stocks.** Nation. Nurseryman **31**: 112–114. 1923.—The history is recounted of the introduction of resistant *Pyrus ussuriensis* and *P. calleryana* from China to be used as stocks for grafting native pears. *P. betulaefolia* is likely to be confused with *P. Calleryana* by seed collectors in China. The former is extremely

susceptible to pear blight. Using these resistant stocks and developing the resistant varieties of *P. communis*, it is estimated trees will be developed which will be 75–90 per cent proof against the disease.—*J. A. Faris.*

5628. Oortwijn, Botjes J. **Hetverouderen van aardappelsoorten in verba[illegible] met die vegetative voortplanting. [Age of potato varieties in relation to vegetative repr[illegible] that of the** Cultura **35:** 65–66. 1923.—The writer does not agree with Paravicini's statements that the relation of potato diseases to higher susceptibility in old age cannot be demonstrated. A crop of an old variety may possibly give rise to a large percentage of bud variations, which externally can not be easily differentiated from the original mother type. Potato varieties are generally very heterozygous, which may be an advantage as regards formation of bud variations.—*J. C. Th. Uphof.*

5629. Rau, A. S., and J. B. Gatenby. **Notes on the distribution, morphology and cytology of the organ of Bidder.** Jour. Roy. Microsc. Soc. London **1923:** 19–36. *2 pl.* 1923.—Bidder's organ, a structure closely attached to the anterior end of the testes in some toads, is shown by cytological study to be a group of abnormal oocytes. This is interpreted as evidence for a primitive hermaphroditism among the amphibia.—*R. E. Cleland.*

5630. Siemens. [German rev. of: Meulengracht. **Über die Erblichkeitsverhältnisse beim chronischen hereditären hämolytischen Ikterus. (On the hereditary relation of chronic, hereditary, hemolytic ikterus.)** Deutsch. Arch. Klin. Med. **136:** 33.] Arch. Rass.- u. Ges.-Biol. **14:** 445. 1923.

5631. Sirks, M. J. **Die Farbenfaktoren der Samenschale von Phaseolus vulgaris L. und P. multiflorus Willd. [The color factors in the seedcoat of Phaseolus vulgaris and P. multiflorus.]** Mededeel. Landouwhoogeschool Wageningen **23**[4]: 1–40. *3 col. pl.* 1922.—The following varieties of *P. vulgaris* were used: (1) Witte boonen—white beans without colored navel ring; (2) Citroenboonen—lemon beans, lemon colored without colored navel rings; (3) Wagenaar—directly after harvest lemon colored, with brown ring around the navel, soon becoming gray and finally light yellow-brown; (4) brown beans; (5) Rotjes boonen—rat beans with gray-brown seed color, of which 2 types were distinguished,—a light and a dark colored one; (6) black beans; and (7) Kievietsboonen—plover beans, being constantly red-violet mottled on a yellowish-white background. In a cross of lemon bean × Wagenaar, the F_1 generation showed entire dominance of the Wagenaar and the F_2 gave a monohybrid ratio. With Wagenaar × brown bean the F_1 produced the seed color of the brown bean and behaved as monohybrid. Lemon bean × brown bean in F_2 gave a monohybrid ratio, 3 brown : 1 lemon. In other cases it behaved as a dihybrid and produced brown, Wagenaar, and lemon, but in a ratio other than the expected one, namely, 12:3:1. In lemon bean × rat bean, the F_1 individuals were red-brown. The F_2 was composed of 8 distinct phenotypical groups: (1a) dark red-brown, (1b) red-brown (resembling F_1); (2a) dark gray-brown, (2b) gray-brown (these 4 groups having brown colored navel ring); (3) gray-brown, uncolored navel ring; (4) yellow bean; (5) Wagenaar type; (6) lemon type. The frequency of above types in artificial and spontaneous crosses was 17: 29:4:10:23:12:5:12, a total of 112. By combining groups (1a) with (1b) and (2a) with (2b) it suggests a trihybrid ratio. Brown bean × rat bean also appeared to be a trihybrid. With lemon bean × plover bean, the F_1 seeds were red-violet mottled on yellow-brown background. The F_2 gave 8 distinct groups: red-violet on yellow-brown background resembling the F_1 plants; yellow-brown; Wagenaar type; plover type; lemon type; yellow-white mottled; pure white; pure white with brown navel ring. As to subtypes, some distinctions were made as to color shades. They occurred in the above order with the following ratio: 106:39:15:37:17:35:18:2, a total of 269. Brown bean × plover bean and rat bean × plover bean behaved as trihybrids. Brown bean × black bean in F_1 is black and produces in the F_2 black, red-brown, and yellow-brown in the ratio 39:6:3. Plover bean × black bean was a spontaneous hybrid, with black mottled seed on grayish background. The F_2 produced 53 plants having no white seed. Therefore, it was suggested that the pollen plant was probably

a black-seeded plant. There were 11 phenotypes: black mottled on gray background; bluish mottled on gray background; dark blue-violet mottled with white-yellow background; light blue-violet mottled on light yellow background; gray-brown mottled, here and there violet; red mottled, here and there violet; yellow-brown mottled, here and there violet; black; red-brown; Lagenaar type. On account of the few seed obtained no definite ratio could be determined. With regard to the cross, brown bean × white bean, the F_1 was black mottled with yellow background. The F_2 gave 9 color types: F_1 type; red-brown mottled on yellow-brown; gray-brown on gray-white; yellow-brown mottled on light yellow background; black; red-brown; gray-brown; yellow-brown; entirely white. The ratio was 97:24:10:17:55:18:33:87, a total of 366. The writer presents in detail the various factors and various possibilities as to formation of various colors. *P. multiflorus* is not as easy to work with as the other species, as it is more easily cross pollinated. Concerning the different color factors of the seedcoat, (1) white is recessive; (2) light mottled is recessive to black mottled; (3) spotted predominates over mottled; (4) black predominates over light mottled, also over white.—*J. C. Th. Uphof.*

5632 Sprenger, A. M. **Verbetering der vruchtencultuur door middel van selectie. [Improvement of fruit growing through selection.]** Natuurwetenschapp. Tijdschr. 4: 223–233. 1922.—A general review is presented of stock selection for various fruit trees. Bud mutations are mentioned of a peach tree forming a nectarine. A bunch of white grapes was formed by a vine which ordinarily bore blue berries. An apple tree, Pomme de Coeur, produced a branch with entirely different fruits. Bud mutations were further observed 3 times on Gold Reinette and once on Landsberger Reinette.—*J. C. Th. Uphof.*

5633. Stout, A. B. **Alternation of sexes and intermittent production of fruit in the spider flower (Cleome spinosa).** Amer. Jour. Bot. **10**: 57–66. *1 pl., 1 fig.* 1923.—One hundred and twenty-eight plants of this species were studied. Development of the sex organs is very various in different flowers on the same plant. Some flowers function only as males, some only as females, and some are completely bisexual. Various intergrades occur between these types, 1 or the other of the sexual organs being partially aborted, but 1 type is never transformed into the other, as so often happens among animals. The variations from one extreme to the other are alternative and cyclic, all the flowers produced at 1 period being male and this period being followed by 1 in which female or bisexual flowers are developed. This results in intermittent production of fruit. The plants studied were all similar, none being exclusively staminate or pistillate. The flowering period is coincident with the period of greatest vegetative activity. The recurring periodic changes in the sex of the flowers are regarded as phenomena of internal regulation closely related to the influences which determine the development of the plant as a whole. Stamens and pistils only are affected, the other floral organs being similar in all the flowers. Conditions in this species favor the view that there is a tendency among higher plants away from hermaphroditism toward dioecism. The author regards the morphological differentiation of sex to be fundamentally an extension of somatic differentiation, and believes that the theory of sex chromosomes fails in its application to plants.—*E. W. Sinnott.*

5634. Sumner, F. B. **Studies of subspecific hybrids in Peromyscus.** Proc. Nation. Acad. Sci. [U. S. A.] **9**: 47–52. 1923.—Three crosses were made between geographic races yielding 347 F_1 and 296 F_2 individuals; also a study of 17 quantitative characters,—lengths of body, tail, foot, ear, pelvis, femur, skull, indices of asymmetry (sinistro-dextral ratios) in respect to pelvis length, femur length, femur weight, jaw weight; width of tail stripe, depth of pigmentation of foot, percentage of "black," white," and "color" in pelage, ratio of red to green in color readings. Mean values obtained for any character in the hybrids usually lie between the parental values, not usually equidistant, but may agree closely with or lie beyond the parental values. Means of F_1 and F_2 frequently agree, although there is a preponderant tendency for the former to exceed the latter. No evidence was secured for mendelian dominance for any single character. Tendency for increased variability from F_1 to F_2 is no greater for characters in which parent races differ than for characters in which

parent races agree; this appears especially in sinistro-dextral ratios, although these ratios are not hereditary, and it is not due to environmental factors. Coefficients of parent-offspring correlation for all crosses and characters average less than + 0.3. Mean fraternal correlation is fairly large in F_1 and F_2, slightly greater in the former. Intra-individual correlation coefficients show that most characters associated geographically are not correlated in individuals of 1 subspecies, nor do they show any tendency to be linked in inheritance unless they are correlated in parental stocks. Doubt is expressed as to adequacy of the multiple factor hypothesis. Blending or cytoplasmic inheritance may be considered. No explanation is offered of segregation of non-hereditary characters. Heribert-Nilsson, from work on willows, questions that specific characters blend while varietal ones mendelize. In *Peromyscus* no racial characters obviously mendelize. Comparison is made with Phillips' results from bird crosses. Harrison, from work on moths, has come to postulate more gametic blending in specific than in varietal crossings. Detlefsen's results with *Cavia* may be explained by blending inheritance. It is regarded as dogmatic and premature to universalize principles of mendelian segregation.—*P. W. Whiting.*

5635. Thapar, G. S. **The occurrence and significance of a third contractile vacuole in Paramecium caudatum (Ehr.).** Jour. Roy. Microsc. Soc. London 1923: 64–68. 1923.—The individuals with 3 vacuoles do not represent a distinct genetic strain. The appearance of a 3rd contractile vacuole is probably due to increasing amounts of soluble crystalloids which must be eliminated. Favorable environmental conditions, making for a high rate of metabolism, coupled with a slowing down in the division rate, due to the old age of the culture, account for this accumulation. The new vacuole is formed at the point where the crystalloids accumulate.—*R. E. Cleland.*

5636. Walker, E. W. A. **Studies in bacterial variability.—On the occurence and development of dys-agglutinable, eu-agglutinable and hyper-agglutinable forms of certain bacteria.** Proc. Roy. Soc. London B 93: 54–68. 1922.—In enteric and dysenteric groups of bacteria dys-agglutinable and hyper-agglutinable forms or phases occur and can be produced experimentally. Both may be obtained from the same eu-agglutinable strain of a bacillus and both may revert or be mutually converted.—*P. B. Sears.*

5637. Zade. **Die Sortenunterscheidung mit Hilfe des biologischen Eiweisdifferenzierungsverfahrens. [Variety separation with the help of biological protein differentiation processes.]** Beitr. Pflanzenzucht 5: 170–181. Discussion *p. 181–183.* 1922.—A physiological test for identifying varieties is described. About 10 gm. of fine meal, made from seeds of wheat, peas, oats, barley, etc., singly or combined, of known varietal purity, are shaken up with a quantity of physiological common salt solution (0.95 per cent) in distilled water. After settling and filtering, the sterilized solution is injected into rabbits, subcutaneously, intravenously, or intraperitoneally, weekly for 8 or 9 weeks. Blood is then taken from ear vein, allowed to settle, and serum tested against original seed solution by "layer," "mixing," or other method. Proper condition is evidenced by a precipitate and animal is bled, and the blood serum tested against seed extracts. By proper thinning, strong precipitate follows only on the use of the homologous solution. By using several varieties in making up this solution used for injection and then omitting the components successively in testing against the blood serum and substituting an unknown variety, its identity is finally established if corresponding to one of the sorts used in the original solution. Blood sera from animals treated singly with solutions made up from a series of varieties can be used in the same way, the unknown variety being identified by the approprate reaction. Sorts genetically identical or strains of the same variety can not be separated. The reactions are relationship reactions. The method is difficult and expensive on account of the large number of animals required. It is sufficient for purely botanical purposes for distinguishing sorts or species, but is not recommended further. The method needs simplification and refinement.—*C. E. Leighty.*

HORTICULTURE

J. H. Gourley, *Editor*
John Bushnell, *Assistant Editor*

(See also in this issue Entries 5290, 5304, 5320, 5341, 5342, 5346, 5395, 5452, 5464, 5521, 5618, 5632, 5780, 5883, 5897, 5933, 5948, 5993, 5995, 6016, 6035, 6067, 6124)

FRUITS AND GENERAL HORTICULTURE

5638. Anonymous. **Agricultura practica del café.** [Practical coffee culture.] Rev. Agric. Puerto Rico 9[3]: 29–34. 1922.—The coffee plantations of Porto Rico are in very poor condition due to improper care. The author outlines proper cultural methods including preparation of seed beds, transplanting, and regulation of the shading.—*John A. Stevenson.*

5639. Anonymous. **Commercial English walnut orchard in the East.** Amer. Nut Jour. 17: 61. 1922.

5640. Anonymous. **Testing alfalfa in the** [fig] **orchard.** Associated Grower 3[7]: 22. 1922.

5641. Allen, William S. **Desarrollo de las regiones plataneras Tabasco y Chiapas.** [Development of the banana regions in Tabasco and Chiapas. Rev. Agric. [Mexico] 7: 320–325. *4 fig.* 1922.—The Gros Michiel variety of banana does well in the southern provinces of Mexico where it is grown for export to the U. S. A. Considerable additional land is available for development. Costs of production are outlined. Yields average 700 bunches per hectare the 1st year and 1,000 thereafter.—*John A. Stevenson.*

5642. Batchelor, L. D. **Winter injury to young walnut trees. 1921–22.** Monthly Bull. California Dept. Agric. 11: 445–449. *Fig. 163–165.* 1922.—Winter injury is said to result from unfavorable soil or climatic conditions, chiefly early fall frosts before the trees are dormant. The author discusses the effect of frost on young and old trees and gives the critical temperatures and the symptoms of injury.—*E. L. Overholser.*

5643. Beckwith, Charles S. **The effect of fertilizer treatments on Savannah cranberry land.** Soil Sci. 12: 183–196. 1921.—The most profitable sources of nitrogen appear to be sodium nitrate and dried blood, 20 pounds of nitrogen from the former source producing as large a crop as 30 from the latter. Ammonium sulphate and calcium cyanamide are unsatisfactory and of doubtful value as nitrogen sources. Cranberry bogs seem very deficient in phosphoric acid and applications of as high as 80 pounds of phosphoric acid per acre produced large crop increases. Acid phosphate and rock phosphate were efficient sources of phosphoric acid, and potassium sulphate and potassium chloride were good sources of potash; 500–800 pounds per acre of a complete fertilizer mixture gives best results on cranberry bogs. Overfertilization causes excessive vine growth and soft berries, and renders vines more susceptible to insect attack.—*Irl T. Scott.*

5644. Beekhuis, William. **The raisin industry of California.** Associated Grower 3[7]: 20. 1922.—The author gives the history of this industry in California and briefly describes the planting and care of vineyards and the picking and curing of grapes for raisins.—*E. L. Overholser.*

5645. Betz, C. **Birnen auf Sorbus veredeln nicht empfehlenswert.** [Pear grafting on Sorbus is not to be recommended.] Möllers Deutsch. Gärt. Zeitg. 38: 50–51. 1923.—When pear is grafted on seedlings of *Sorbus aucuparia* the fruits have a flavor of tannic acid and are therefore valueless as table fruit. Fruits of *Sorbus* are used in some parts of Germany in the manufacture of apple cider on account of the tannic acid content.—*J. C. Th. Uphof.*

5646. Bioletti, Frederic T. **Grafted vines.** Associated Grower 5⁴: 24. 1923.—On grafted vines all shoots but 1 are removed, which is tied to a stake. Suckers and roots from the scion should be removed 2 or 3 times during the summer.—*E. L. Overholser.*

5647. Bioletti, Frederic T. **Notes on double planting and cordon pruning for muscat vines.** Associated Grower 3⁷: 9. 1922.—Cordon pruning of muscat grapes as opposed to head pruning did not increase the crop of vigorous vines, and decreased the crop of weak vines 27.8 per cent. Changing the planting distance of muscat vines from 6 × 12 to 3 × 12 feet increased the crop 94 per cent at 5 years of age. This increase would probably disappear as the vines became older.—*E. L. Overholser.*

5648. Bioletti, Frederic T. **Some defects of the Black Monukka grape.** Associated Grower 5¹: 24. 1923.—While useful as a raisin, shipping, or juice grape, it is subject to spring frost injury. When allowed to overbear is poor in quality and does not ship well. Cordon pruning with short spurs remedies this difficulty.—*E. L. Overholser.*

5649. Blokzeijl, K. R. F. **Spice trade of Dutch East Indies.** Pharm. Era 55: 243–245. *4 fig.* 1922.—The author briefly describes the cultivation and harvesting of *Myristica*, Macis, *Caryophylus*, *Cinnamomum*, and *Capsicum* in the Dutch East Indies.—*C. M. Sterling.*

5650. Blokzeijl, K. R. F. **The quinine situation in Java.** Pharm. Era 55: 348. 1922.

5651. Britton, J. C. **The pruning of pecan trees.** Amer. Nut Jour. 18: 20. 1923.—No pruning is recommended for 2 or 3 years after planting. Young vigorous trees should be pruned 50 per cent, chiefly by coarse thinning, followed by summer pruning of water sprouts. Trees severely cut back are easier to spray.—*E. L. Overholser.*

5652. Clark, Karl B. **Weighing bunches of grapes on the vines.** Associated Grower 4³: 8, 23. 1922.—Bunches were weighed by the displacement method and the determination of the specific gravity when the sugar content was 18 per cent and later when it was 23 per cent. The grapes increased 15 per cent in weight between the times of picking for fresh shipment and for raisins.—*E. L. Overholser.*

5653. Condit, I. J. **Colonizing caprifig trees.** Associated Grower 4³: 24. 1922.—Caprifig trees may be colonized by hanging baskets containing fertile mammoni figs in the caprifig trees during summer and fall rather than in April.—*E. L. Overholser.*

5654. Condit, I. J. **More fig facts and figures.** Associated Grower 4¹: 13, 22–23. 1922.—Kadota figs are being more extensively planted in California at present than any other variety, but are susceptible to red spider. The Cordelia fig, used for caprification in some districts, is worthless for that purpose. The Black San Pedro variety is of no value in the interior valleys. The best caprifig variety is the Stanford; Roeding No. 3 is good, but the Markarian No. 2 is not satisfactory. The author briefly describes the fig smut investigation and fertilizer trials being carried on by the California Experiment Station.—*E. L. Overholser.*

5655. Condit, I. J. **The Stanford Smyrna fig.** Associated Grower 4³: 6. 1922.

5656. Condit, I. J. **Topworking fig trees.** Associated Grower 5³: 14–15, 23. 1923.—Young fig trees of undesirable varieties may be topworked between April and October by shield budding on 1–3-year-old branches. Older trees may be topworked by cleft grafts early in the season or by bark grafts in April or May. Two-year-old scions are used.—*E. L. Overholser.*

5657. Daniel, Lucien. **Variations des parfums sous l'influence du greffage. [Variations in perfumes under the influence of grafting.]** Compt. Rend. Acad. Sci. Paris 176: 999–1001. 1923.—It is found that volatile products of the epibiot are in certain instances modified

in quantity and quality by the hypobiot used. In *Artemisia absinthium* the taste and odor as well as certain structural characters are different if grafted on other hypobiots. This difference increases with age, and there is some evidence that it may be transmitted in the seed.—*C. H. Farr.*

5658. Delaire, Eugene. **Savez-vous comment les Chinois obtiennent des arbres nains? [How do the Chinese produce dwarf trees?]** Nat. Canadien 49: 63–64. 1922.—The tree seed is planted in soil in an orange skin, the rootlets coming through the orange rind being clipped off for 2 or 3 years. The mature tree may thus not much exceed a handbreadth.—*A. H. MacKay.*

5659. Demaree, J. B. **Pecan kernel-spot and its relation to insect punctures.** Amer. Nut Jour. 17: 66. 1922.—Pecan kernel-spot is caused directly by punctures of a sucking insect, particularly the Southern stink bug, *Nezara viridula.* Substituting velvet beans for cowpeas as a cover crop aids in controlling the pest.—*E. L. Overholser.*

5660. Earle, F. S. **La industria del café en Puerto Rico. [The coffee industry in Porto Rico.]** Rev. Agric. Puerto Rico 9[6]: 5–6. 1922.—The present ruinous condition of the coffee industry in Porto Rico is due not to economic conditions but to faulty cultural practices, which include too close planting, excessive shading (which favors development of fungous diseases), using shade trees that harbor injurious coffee insects, and careless pruning.—*John A. Stevenson.*

5661. Girola, Carlos D. **Cultivo de la yerba mate. Torrefaccion y preparacion del producto. [Cultivation of yerba mate. Curing and preparation of the product.]** Bol. Ministerio Agric. Nacion [Argentina] 26: 447–488. *26 fig.* 1921.—The author discusses at length the picking, curing, and commercial handling of yerba mate (*Ilex paraguariensis* St. Hil.). [See also Bot. Absts. 12, Entry 5911.]—*John A. Stevenson.*

5662. Girola, Carlos D. **Cultivo de la yerba mate. Vegetación, morfología e histología de las hojas. [Cultivation of yerba mate. Development, morphology, and histology of the leaves.]** Bol. Ministerio Agric. Nacion [Argentina] 27: 247–261. *7 fig.* 1922.—The author describes leaves and flowers of yerba mate (*Ilex paraguariensis*), a plant which may develop into a tree but on plantations is kept down to bush form by pruning. The structure of the various leaf tissues is given in detail, based on the work of Lendner. [See also Bot. Absts. 12, Entry 5911.]—*John A. Stevenson.*

5663. Gram, H. **Ompodning af Frugttraeer. [Grafting of old fruit trees.]** Haven 23: 17–24. *Fig. 1–12.* 1923.—Directions are given for the different methods of rejuvenating orchards.—*Ernst Gram.*

5664. Grist, D. H. **Kapok.** Malayan Agric. Jour. 11: 3–27. 1923.—The author reviews the present status of Kapok (*Eriodendron anfractuosum*) and its products. Sections are devoted to its botanical features, uses, buoyancy value in life-jackets, by-products (the seed yields oil and feeding-cake), oil, climate suitable for cultivation, soil, propagation, age of bearing, pests and diseases, harvesting, ginning, pressing and baling, markets and yield. Appendices deal with the organization of the kapok industry, lists of importers of kapok in England, America, and Australia, and a statement of costs and income of 500 acres in 1911.—*R. E. Holttum.*

5665. Halbert, H. A. **Will pecans come true to variety when nuts are planted?** Amer. Nut Jour. 17: 7, 11. 1922.—Pecan seed reproduce the variety provided pollination has been by the same variety.—*E. L. Overholser.*

5666. Helgason, E. **Korte Traek fra Islands Havebrug. [Short remarks on horticulture in Iceland.]** Haven 23: 33–36. 1923.

5667. Henriquez, J. Acosta. **Sombra para cafetales. [Shade for coffee plantations.]** Rev. Agric. Puerto Rico 8^5: 19–26. 1922.—Shade for coffee plantations is considered of very great importance in Porto Rico. Bananas are planted for temporary shading until the permanent growth of leguminous trees is ready. The trees most commonly used are Guava and Guama (*Inga* spp.), Moca (*Andira inermis*), and Bucare (*Erythrina* spp.). These trees and the character of the shade given are described. Growing seedlings in nursery beds is recommended instead of the present method of using chance seedlings. Preparation of seed beds is described. Certain shade trees which harbor insect pests and fungous diseases of coffee plants should be eliminated. Pruning and a definite system of renewal, to which no attention is paid at present, must be practised for successful coffee cultivation.—*John A. Stevenson.*

5668. Hodgson, Robert W. **Cover crop pointers.** Monthly Bull. California Dept. Agric. 12: 48–51. 1923.—Purple vetch, *Vicia atropurpurea* Desf., is promising and will be widely planted in citrus orchards, partially replacing *Melilotus indica* [(L.) All.], due to its more rapid growth.—*E. L. Overholser.*

5669. Hoyt, W. B. **Blackberries in south Florida.** Florida Grower 27^{13}: 4. 1923.—A variety called Australian is described as being suitable for southern Florida. The fruit ripens from May to June, and directly afterward the old twigs are cut and the new growth trained to the wires. Plants may be set at any time of the year if given plenty of moisture, but during dry weather they should be well shaded until thoroughly rooted.—*J. C. Th. Uphof.*

5670. Keller, H. R. **Results with cover crops.** Associated Grower 3^6: 16. *Fig. 1.* 1922.

5671. Lange, A. **Vinteren 1921–22 Virkning paa Havplanterne. [The effect of the winter 1921–22 on garden plants.]** Nat. Verden 6: 277–280. 1922.

5672. Legrand, J. Federico. **Cultivo del alcanfor en Puerto Rico. [Cultivation of camphor in Porto Rico.]** Rev. Agric. Puerto Rico 6^6: 7–10. *1 fig.* 1921.

5673. Legrand, J. Federico. **Plantas útiles de Puerto Rico. [Useful plants of Porto Rico.]** Rev. Agric. Puerto Rico 6^1: 21–25. 1921.—The author gives the botanical classification, physical and chemical properties, and uses of *Peperomia rotundifolia*, *Amarantus viridis*, *Heliotropium indicum*, and *Heliconia caribea.*—*John A. Stevenson.*

5674. Legrand, J. Federico. **Plantas útiles de Puerto Rico. El cacao. [Useful plants of Porto Rico. Cacao.]** Rev. Agric. Puerto Rico 6^7: 7–16. 1921.—The author discusses the botanical characteristics, structure and composition of the seed, cultivation, and uses of cacao. —*John A. Stevenson.*

5675. Legrand, J. Federico. **Plantas útiles de Puerto Rico. El café. [Useful plants of Porto Rico. Coffee.]** Rev. Agric. Puerto Rico 6^4: 11–20. *7 fig.* 1921.—Botanical characteristics, chemical and physical properties, culture, uses, and commercial aspects of coffee are given.—*John A. Stevenson.*

5676. Leitch, Mariá, y Margarita W. Leitch. **El aguacate guatemalteco. [The Guatemalan avocado.]** Rev. Agric. Puerto Rico 7^4: 5–34. *18 fig.* 1922.—The author discusses the possibilities of the successful culture in Porto Rico of Guatemalan varieties of avocado, based largely on opinions of horticulturists in the Island and the continental U. S. A.—*John A. Stevenson.*

5677. Mackie, D. B. **Vacuum fumigation of citrus nursery stock in Ventura County.** Monthly Bull. California Dept. Agric. 11: 726–735. *Fig. 172–176.* 1922.

5678. Mari, Matiano. **La vainilla. [Vanilla.]** Rev. Agric. Puerto Rico 9^5: 29–31. 1922.

5679. Morris, Robert T. **Paraffin in hot climates.** Amer. Nut Jour. 17: 47. 1922.—To prevent melting of the paraffin covering of grafts, stearic acid is added to the paraffin, and the grafts are whitewashed.—*E. L. Overholser.*

5680. Mosnat, H. R. **The Lewis hardy black walnut.** Amer. Nut Jour. 18: 60. 1923.—The variety is large, smooth, soft shelled, mild in flavor, and is adapted to many waste acres in the Corn Belt. Half meats can be obtained and find a market. By-products can be made from the husk.—*E. L. Overholser.*

5681. Müller, R. **Stachelbeer-Erfahrungen.** [Gooseberry experiences.] Möllers Deutsch. Gärt. Zeitg. 38: 65–66. 1923.—The largest varieties are not always of commercial advantage. Medium to large fruited varieties with somewhat hairy and thin skins are best commercially. Some markets demand red, others yellow and dark green, varieties. The red are used for marmalade, the dark green for preserving. The prolific varieties with medium sized, thin skinned fruits are most suitable for wine making. They are planted late in October or late in March or early April and the twigs pruned back to 3 buds. Strongly developed 1-year-old twigs are pruned back to 6–8 buds. Distance of planting is 1.7–1.8 m.—*J. C. Th. Uphof.*

5682. Oliveira, Artura A. **Métodos practicas para el cultivo de la yerba mate en la territorio de Misiones.** [Practical methods for the cultivation of yerba mate in the Territory of Misiones.] Bol. Ministerio Agric. Nacion [Argentina] 26: 403–407. 1921.—Directions are given for growing *Ilex paraguariensis* St. Hil. from the preparation of the soil and planting to harvesting and curing the leaves.—*John A. Stevenson.*

5683. Overholser, E. L. **Effects of thinning peaches.** Assoc. Grower 5^4: 7. 1923.

5684. Overholser, E. L. **Future outlook for California's new deciduous fruit acreage.** Assoc. Grower 4^2: 12, 25–27. 1922.

5685. Quail, John L. **Pruning peach trees.** Assoc. Grower 5^1: 40. 1923.—The author cautions against too little pruning and too little thinning of fruit under the "long pruning" system. Care should be taken in training young trees, and only 3 main limbs left.—*E. L. Overholser.*

5686. Read, F. W. **Facts and figures regarding the deciduous fruit industry.** Monthly Bull. California Dept. Agric. 12: 39–43. 1923.

5687. Reinhardt, H. **Stachelbeere Runde Weisse, ein Massenträger.** [Gooseberry Runde Weisse, a prolific producer.] Möllers Deutsch. Gärt. Zeitg. 38: 65. *1 fig.* 1923.—The variety was compared with many others. It is very productive, sweet and thin skinned, and is recommended for wine-making and marmalade.—*J. C. Th. Uphof.*

5688. Rolfs, P. H. **Brazilian fruits and the Centennial.** Florida Grower 27^{16}: 4–5. *4 fig.* 1923.—The indigenous jaboticaba, a Myrtaceous fruit little known outside of Brazil, is delicious and refreshing. The dwarf mangoes are of considerable value. The variety Itamaraca weighs 4–8 ounces, is very much flattened longitudinally, and the meat resembles custard. The Carlotta and Augusta mangoes are also grown. The litchi, avocado, and jack fruit are discussed.—*J. C. Th. Uphof.*

5689. Santa Maria, Miguel. **Cultivo y producción del cocotero en Mexico.** [Culture and production of the coconut in Mexico.] Rev. Agric. [Mexico] 7: 186–188. *4 fig.* 1922.—The coconut thrives in a number of the states of Mexico below the parallel of 25°. The average annual yields are 50–100 nuts per tree. Cultural directions are given.—*John A. Stevenson.*

5690. Schindler. **Erdanschüttungen an Baumstämmen.** [**Earthing up tree stems.**] Möllers Deutsch. Gärt. Zeitg. 38: 67. 1923.—The stem of a wild, 30-year-old, sweet cherry was covered 1 m. with light soil. It produced a new root system in this soil and no damage was observed. The same was observed in a Canada Reinette and a Gravenstein apple in Westerwald.—*J. C. Th. Uphof.*

5691. Schmidt, Richard. **Budding of vines given large scale test.** Assoc. Grower 4^4: 11, 22. 1922.—Budding gives promise of replacing grafting as a means of propagating Vinifera grapes on resistant root stocks. The method of budding used is known as the "Yema graft."—*E. L. Overholser.*

5692. Schmidt, Richard. **New varieties of grapes.** Assoc. Grower 3^6: 19, 34. *4 fig.* 1922.—The Black Monukka grape is early, black, bears heavily but ripens irregularly. It may be shipped or cured for raisins, and is considered promising. The Maraville de Malaga is used as a pollinizer for Ohanez. Its excellent fruit ripens with the Malaga. It does best in the cooler sections on the heavier soils. The Olivette Blanche is excellent in size, shape, and bearing qualities, but lacks flavor. Gros Guillaume is a large blue grape superior to Gros Coleman in flavor and keeping qualities. The clusters, however, fill poorly. The Hunisa bears excellent crops of red berries. The bunches fill well in the Sacramento Valley, but it has proved less satisfactory in the San Joaquin Valley.—*E. L. Overholser.*

5693. Schmidt, Richard. **Pruning new varieties of grapes.** Assoc. Grower 4^5: 12. 1922.—The author tentatively recommends that the Black Monukka grape be pruned like the Thompson Seedless, except that canes be cut shorter; and suggests that Maraville de Malaga, Ohanez, and Olivette Blanche be pruned similarly except that fewer canes be left.—*E. L. Overholser.*

5694. Schultz, E. F. **La naranja de verano "Lue Gim Gong."** [**The Lue Gim Gong orange.**] Rev. Indust. y Agric. Tucuman 12: 121–124. *2 fig.* 1922.—The variety, originated in Florida, has been under successful trial at the Tucuman experiment station since 1915. The crop matures late in the fall and the fruit holds its quality well. The Tucuman orange growers can not now compete with those of other sections of Argentina which have cheap water transportation; but the introduction of this late maturing variety will obviate the difficulty.—*John A. Stevenson.*

5695. Schuster, C. E. **The Barcelona filbert.** Amer. Nut Jour. 17: 77. 1922.—The Barcelona filbert, propagated by layering, is the best variety tested at the Oregon Experiment Station. It is self-sterile; Du Chilly has been found the best pollinator, planted in the proportion of 1 to 8. Harvesting and drying costs for filberts are low and it is so far not necessary to spray.—*E. L. Overholser.*

5696. Schwerin, Fritz von. **Folgen von Erdanschüttungen an Baumstämmen.** [**Results of earthing up tree stems.**] Möllers Deutsch. Gärt. Zeitg. 38: 49–50. *2 fig.* 1923.—Young trees set too deep are often injured, but old ones may be mounded up without damage. Various examples are given. Stems of *Aesculus* 80 years old were banked 2 m. without injury.—*J. C. Th. Uphof.*

5697. Spinosa, Jose P. **Apuntes sobre el cultivo del naranjo referidos especialmente al territorio nacional de Misiones.** [**Orange culture with special reference to the Territory of Misiones.**] Bol. Ministerio Agric. Nacion [Argentina] 27: 3–185. *31 fig.* 1922.—The orange was very extensively cultivated by the Jesuits around their missions during the Spanish regime in Argentina but the culture has gradually dropped away. Oranges are raised extensively, however, in the Territory of Misiones and the industry there is capable of much expansion. Climatic and soil conditions are discussed. The sweet orange is the variety most commonly grown and to a lesser extent the sour orange. Other varieties thought to be adapted to grow-

ing in the territory are described. The author gives detailed methods for successful citrus culture from the preparation of the seed bed to harvesting the fruit. Gummosis is the most serious disease encountered and measures for its control are given.—*John A. Stevenson.*

5698. Tellez, Oliverio. **El nogal-su cultivo, explotacion y plagas. [Culture, exploitation, and pests of the walnut.]** Rev. Agric. [Mexico] 7: 181–185. *7 fig.* 1922.—All of the economic species of *Juglans* grow well in Mexico and more extensive culture is recommended. Varietal descriptions and cultural directions are given.—*John A. Stevenson.*

5699. Woodfin, J. C. **Vine culture under glass.** New Zealand Jour. Agric. 24: 287–293, 344–349. 1922; 25: 345–351. 1922; 26: 39–43, 172–177. *7 fig.* 1923.—The problems in connection with grape growing under glass are discussed under the following headings: situation, description of vine house, size of house, the trellis, the border, planting, distance between plants, descriptive terms used, training the vines, leading vines into house, establishing strong plants, 1st year's training, manuring, ventilation, bearing laterals, routine work, sublaterals, setting and thinning of the berries, the stoning period, the 2nd swelling and coloring, the after ripening period, manuring established vines, watering, black varieties, white varieties, powdery mildew, vine Sclerotinia, grape spot, shanking, scalding, warted leaves, aerial roots, mealy bug, red spider, and thrips.—*N. J. Giddings.*

5700. Woodroof, J. G. **Variation in seedlings—especially pecans.** Amer. Nut Jour. 17: 67. 1922.—At the Georgia Experiment Station the pecan varieties found to produce the best seedlings for propagation purposes were the Bradley, Lee, and Teche.—*E. L. Overholser.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

5701. Børgensen, F. **Vinterens Indflydelse paa en Del stedsegrønne Buske og Traeer i en Have i Hellebaek. [The influence of the winter on several evergreens in a Danish garden.]** Gart. Tidende 38: 337–341. 353–356, 365–366. *Fig. 1–10.* 1922.—An annotated list is given of a collection of foreign trees and shrubs and their hardiness in the severe winter 1921–22.—*Ernst Gram.*

5702. Goos und Koenemann. **Die neue Edeldahlien Zukunft, Friede und Fürstin Anna von Donnersmarck. [The new improved Dahlias Zukunft, Friede, and Fürstin Anna von Donnersmarck.]** Möllers Deutsch. Gärt. Zeitg. 38: 73. *3 fig.* 1923.—Zukunft produces high, free flowers which are red with orange, and yellowish toward the base. The flowerstalk is solid, 40 cm. long. Fürstin Anna von Donnersmarck has light carmin-red flowers, recommended for bouquets. The abundant flowers of Friede are white, with violet toward the center. The flowerstalk is long and solid.—*J. C. Th. Uphof.*

5703. M[üller], G [ustav]. **Neue deutsche Edelnelken. [New German improved carnations.]** Möllers Deutsch. Gärt. Zeitg. 38: 97. *2 fig.* 1923.—Andenken an August Holz has long stems and beautiful, large salmon red flowers. Frigga has pink flowers, 10–12 cm. in diameter. The originator is August Holz.—*J. C. Th. Uphof.*

5704. Müller, Gustav. **Riesen-Edeldahlie Goldglanz. [Giant improved Dahlia Goldglanz.]** Möllers Deutsch. Gärt. Zeitg. 38: 69. *1 fig.* 1923.—The new variety, of the same group as Kalif, produces very large gold-yellow flowers.—*J. C. Th. Uphof.*

5705. Steffen, A. **Verschiedene Vergissmeinnichtsorten und ihr Wert für die Erwerbgärtnerei. [Several forget-me-not varieties and their value in commercial floriculture.]** Möllers Deutsch. Gärt. Zeitg. 38: 81–82. *2 fig.* 1923.—Several varieties are described, especially Perle von Ronneburg, Oblongata Perfecta, Albion, Hindenburg, Ruth Fischer, Marga Sacher, and Isolde Krotz (novelty 1922). Oblongata Perfecta is especially recommended for bouquets and Marga Sacher for pot growing.—*J. C. Th. Uphof.*

5706. Zörnitz, H. **Neuere Stauden.** [New herbaceous plants.] Möllers Deutsch. Gärt. Zeitg. 38: 83–84. 1923.—*Primula Helenae* was originated from crosses between *P. acaulis* hybrids × *P. Juliae*. They are easily propagated by division. *Trollius* Orange König, *Leucanthemum maximum* Ophelia, and *Erica cinerea splendens* are also mentioned. They were originated by George Arends in Ronsdorf.—*J. C. Th. Uphof.*

VEGETABLE CULTURE

5707. Anonymous. **La coliflor.** [Cauliflower.] Rev. Agric. [Mexico] 7: 246–248. 1922.—The culture of cauliflower under Mexican conditions is discussed.—*John A. Stevenson.*

5708. Bremer, A. H. **Om avstand for hvidkaal i forsøk.** [Spacing of cabbage in experiments.] Nordisk Jordbrugsforskning 1922: 289–296. *1 diagr.* 1922.—Cabbage varieties differ in the spread of leaves and resulting space requirements. Crowding of spreading types gives loose heads. For experimental work the space requirements of each variety are determined by a preliminary test.—*Ernst Gram.*

5709. Clayton, E. S. **Onion experiments at Dorrigo.** Agric. Gaz. New South Wales 34: 326. 1923.—A complete mineral fertilizer increased the yield nearly 100 per cent and produced a larger percentage of marketable onions than the untreated land.—*L. R. Waldron.*

5710. Cortes, A. Suro. **Breve estudio sobre la siembra de ajos.** [Garlic culture.] Rev. Agric. Puerto Rico 9[4]: 27–29. 1922.—Seed selection, preparation of the soil, sowing the seed, fertilization, cultivation, and harvesting are discussed.—*John A. Stevenson.*

5711. Dominguez, Ignacio. **La col.** [Cabbage.] Rev. Agric. [Mexico] 7: 189–192. *12 fig.* 1922.—Descriptions of varieties recommended for growing under Mexican conditions are given; cultural directions follow.—*John A. Stevenson.*

5712. Dominguez, Ignacio. **La pequeña huerta cultivo de las raices comestibles.** [The cultivation of edible roots in the small garden.] Rev. Agric. [Mexico] 7: 299–302. *2 fig.* 1922.—Popular.—*John A. Stevenson.*

5713. Dominguez, Ignacio. **La zanahoria.** [The carrot.] Rev. Agric. [Mexico] 7: 133–135. *1 fig.* 1922.—Carrot culture in Mexico is discussed.—*John A. Stevenson.*

5714. Griffith, Jean P. **La industria vegetal en Puerto Rico.** [The vegetable industry in Porto Rico.] Rev. Agric. Puerto Rico 8[6]: 43–50. 1922.—Due to adverse conditions of climate and soil and presence of diseases and insects, vegetables are not produced in great quantities in Porto Rico. Statistics of production of beans, sweet potatoes, yams, yautias, and onions are given. Some vegetable crops can be grown successfully in the uplands. Onions do well in the northwest of the Island. Experimental work aimed at the production of resistant varieties of tomatoes and some other vegetables is under way.—*John A. Stevenson.*

5715. Ibarra, David S. **El cultivo del melon en el Bajio** [Cultivation of the melon in Bajio.] Rev. Agric. [Mexico] 7: 192–195. *5 fig.* 1922.—The Rocky Ford melon has been introduced and grown on a considerable scale in parts of Mexico, but has been allowed to hybridize with other types with a resulting deterioration. Melons in this region are commonly cultivated in alternating rows with corn. Recommendations for improving the crop are given.—*John A. Stevenson.*

5716. Johnsen, J. **Kan Haveaerter saa tidligt?** [Early sowing of garden peas.] Gart. Tidende 39: 113–114. 1922.—With 30 days difference in time of seeding peas the difference in appearance above ground was 11 days, and in flowering only 5. With one exception, the yield of green peas was higher on the late plantings.—*Ernst Gram.*

5717. Legrand, J. Federico. **Plantas utiles de Puerto Rico.** [Useful plants of Porto Rico.] Rev. Agric. Puerto Rico 7[2]: 5–8. 1921.—The author gives briefly the botanical characteristics of *Chrysophyllum cainito*, *Antigonon leptopus*, and *Cucurbita pepo* with an enumeration of the uses to which they are put in Porto Rico.—*John A. Stevenson.*

5718. Lobner, Max. **Die wirtschaftlich wertvollsten Tomaten.** [The most valuable tomatoes economically.] Möllers Deutsch. Gärt. Zeitg. 38: 85–86, 101. 1923.—A description and comparison of the principal tomato varieties is presented. Lukullus Trieb is a resistant, prolific rather late bearer. Schöne von Lothringen is recommended as large and early. Bonner Beste may in the future be of value on account of its earliness. Preys Delicatess, a greenhouse type, is prolific, of compact growth, and has very large fruits. Tuckwood is commonly grown in the Netherlands in glasshouses.—*J. C. Th. Uphof.*

5719. Pitt, J. M. **Farmers' experiment plots. Trials with peas, onions, and other vegetable crops. 1922. Lower north coast.** Agric. Gaz. New South Wales 34: 271–280. *3 fig.* 1923.—The pea variety Greenfeast of the Wonder type, decidedly outyielded all other varieties, producing 514 bushels per acre. This variety is popular in the market and sells well during glut periods. Ten onion varieties were under trial. The variety Odorless yielded 10.6 tons per acre with the Early Barletta at 7.35 tons standing second. Notes are given on other garden crops.—*L. R. Waldron.*

5720. Weishaar, L. J., and S. S. Rogers. **Review of the 1922 broccoli season at Colma, California.** Monthly Bull. California Dept. Agric. 11: 442–445. 1922.—The authors discuss the importance of Colma as a broccoli-producing section and give a history of the Colma Vegetable Association.—*E. L. Overholser.*

5721. Weishaar, L. J., and S. S. Rogers. **Successful marketing of California vegetables.** Monthly Bull. California Dept. Agric. 11: 721–725. 1922.

HORTICULTURE PRODUCTS

5722. Anonymous. **The grapefruit grower becomes a canner.** Florida Grower 27[22]: 3. 1923.—The possibilities of canning grapefruit are presented.—*J. C. Th. Uphof.*

5723. Allen, W. J. **How to dry figs.** Agric. Gaz. New South Wales 34: 376. 1923.

5724. Barnard, L. C. **Peach drying.** Associated Grower 4[2]: 28–29. 1922.

5725. Berg, E. A. **Putting figs on the American table.** Associated Grower 5[1]: 32. 1923.

5726. Cruess, W. V. **Raisin by-products.** Associated Grower 5[4]: 12, 26. 1923.—A carbonated beverage called Raisinade, a raisin syrup, and several raisin candies have been perfected by the Fruit Products Division of the California Experiment Station.—*E. L. Overholser.*

5727. Eaton, B. J. **"Whole" rubber or desiccated latex.** Malayan Agric. Jour. 10: 288–294. 1922.—Non-caoutchouc constituents of latex provide valuable vulcanization accelerators; these are lost by ordinary coagulation methods. The Hopkinson process for the preparation of "whole" rubber by desiccation of latex (in an apparatus similar to that used for milk desiccation) is described. It is claimed that this rapid process gives a vulcanized rubber of greater tensile strength and uniformity than the ordinary milled rubber. There are practical difficulties to be overcome.—*R. E. Holttum.*

5728. Eaton, B. J., and J. H. Dennett. **Preliminary and interim report on investigations on the production of alcohol from Nipah palms.** Malayan Agric. Jour. 11: 47–63. 1923.—The actual area at present covered with *Nipa fruticans* in the Federated Malay States is estimated at about 18,000 acres. Experimental tapping was carried out in 3 areas. According to

local custom a preliminary treatment covering 3 months is necessary before tapping commences, but it is hoped this can be reduced. Yields were irregular, but it is considered that with proper treatment ¼–⅓ gallon of juice per palm per day can be obtained. Experiments indicate that control of fermentation of the juice is easier than has been reported from the Philippines; natural fermentation is far from complete after 24 hours if glazed vessels are used. The average sugar content of the juice is about 12.5 per cent. No great difficulties are expected in the manufacture of alcohol. The production of high grade sugar is difficult because of (1) inversion of sugar during collection and (2) the presence of persistent organic nitrogenous substances. Some notes on planting methods are appended.—*R. E. Holttum.*

5729. Eaton, B. J., and J. H. Dennett. **The comparative buoyancy of Malaya and Java Kapok.** Malayan Agric. Jour. **10**: 295–300. 1922.—Experiments show that the Malaya samples are only slightly inferior to the Java samples and are well above the Board of Trade standard of buoyancy for life-jackets. More details are necessary as to the conditions under which the standard tests should be carried out.—*R. E. Holttum.*

5730. Georgi, C. D. V. **Cashew nut oil.** Malayan Agric. Jour. **10**: 301–302. 1922.—Kernels of nuts of *Anacardium occidentale* are shown to contain 40–45 per cent of oil, but a high pressure is required for complete extraction; the cake remaining after extraction contains 33.4 per cent of albuminoids.—*R. E. Holttum.*

5731. Georgi, C. D. V. **Kapok oil.** Malayan Agric. Jour. **10**: 284–286. 1922.—Seeds of Kapok (*Eriodendron anfractuosum*) contain 20 per cent of oil which is easy to extract; analyses and properties of the oil are given. It is used to a small extent for edible and soap-making purposes, and will probably be more used when larger supplies are available. After extraction of the oil the cake contains 3.98 per cent of nitrogen and is a valuable feeding stuff.—*R. E. Holttum.*

5732. Overholser, E. L. **Keeping the fig in fresh condition by low temperatures. I.** Associated Grower 3^6: 9, 33–34; 3^7: 13. 1922.—Fresh figs can be stored at 32°F. for short periods only. Freezing at 10 and 26°F. were tested. The methods were: (1) immersion in water or sugar solution in sealed containers and (2) glazing the fruit with ice. Fruit stored at 10°F. kept as late as April 1. Glazing with ice was unsatisfactory. Fruits soften rapidly after removal from storage and are best used for cooking. Those held in 30–50 per cent sugar at 10°F. may be eaten as fresh fruits within 8–10 hours after taken from storage.—*Mary Barrett.*

5733. Weishaar, L. J. **Net weight or quantity marking requirements for fruit and vegetable containers.** Monthly Bull. California Dept. Agric. **11**: 450–454. 1922.

5734. Wiegand, Ernest H. **Recirculation driers.** Oregon Agric. Exp. Sta. Circ. **40**. *11 p., 6 fig.* 1923.—The main advantages of recirculating the air in prune driers are: (1) saving heat and fuel, (2) adding moisture to the air, (3) decreasing drying time, (4) lowering drying cost, and (5) increasing the quality by lowering the temperature. Detailed instructions are given for building this new type of prune drier, and for remodeling the older types.—*C. E. Owens.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 5426, 5442, 5633, 5657, 5662, 5934, 5949, 5950, 5951, 5986, 5987, 6003, 6036, 6066, 6084)

5735. Arber, Agnes. **On the leaf-tip tendrils of certain monocotyledons.** Jour. Indian Bot. Soc. **3**: 159–169. *3 pl.* 1923.—The anatomy of leaf-tip tendrils is described and figured for representatives of 5 genera (*Gloriosa, Littonia, Sandersonia, Fritillaria,* and *Polygonatum*)

of Liliaceae, and for *Flagellaria indica* L. Leaf anatomy of all three genera (*Flagellaria*, *Susum*, and *Joinvillea*) of Flagellariaceae is also given. Tendril tips all coil downward in the Liliaceae, and upward in *Flagellaria*. In the liliaceous leaves the numerous bundles, each with its own sheath of sclerotic tissue, gradually coalesce into 3 bundles in the tendril, and finally into 1. In *Gloriosa*, *Littonia*, and *Sandersonia* the 3 bundles are embedded in a single massive sheath of sclerotic tissue. In the *Flagellaria* tendril there are several bundles in a single sheath, but most of the sclerenchyma is in the mesophyll, quite distinct from the vascular bundles. *Susum* leaves show several series of bundles in the sheath and leaf base. The smallest bundles toward the center of the upper surface of the leaf are inversely oriented. *Joinvillea* leaves are plicate, with large epidermal cells at the bases of the grooves. Sheath and leaf base also have more than 1 series of bundles.—On the phyllode theory, the leaves of *Flagellaria* may be interpreted as "consisting of a sheath succeeded by a limb which is a horizontally expanded petiole," while the tendril represents the "apical part of this flattened petiole." The liliaceous leaves may be similarly interpreted, or possibly "the limb in these species may be of leaf-sheath nature, in which the tendril may represent either the apex of the leaf-sheath, or the vestigial rudiment of a petiole." The structure of leaf-tip tendrils seems to be determined "by the inherent anatomical tendencies of the species, rather than by the response to a common physiological need."—*Winfield Dudgeon.*

5736. Bailey, I. W. **Notes on neotropical ant-plants. II. Tachigalia paniculata Aubl.** Bot. Gaz. **75**: 27–41. *Pl. 1–2, fig. 1–3.* 1923.—The leaf of this leguminous plant is characterized by a hollow fusiform petiole or rachis base. More than 30 species of insects were found inhabiting the petiole cavities. Beetles at first cut their way into the cavities and feed upon the wall of amber-colored medullary tissue. Certain coccids are also present and furnish the beetles with a sugary exudate. Ants (*Azteca* or *Pseudomyrma*) eventually drive out the beetles. The stimulation of the ants while biting out tissue to enlarge the cavity induces changes involving a widening of the primary rays and an inhibition of certain thick-walled elements. The ants, it is believed, feed vicariously through the agency of the coccids, using not only the excretions of the latter but also directly consuming the body of the insect. "There is no evidence to indicate that the structural peculiarities of *T. paniculata* are initiated by ants or by gall forming insects, or that they originated as adaptations for attracting a defending army of ants. The relations between the host plant and the beetles and the ants are not those of a mutually beneficial symbiosis but an interesting type of parasitism, in which there is a remarkable parallelism in the behavior of representatives of such widely separated groups of insects as the Hymenoptera and Coleoptera. The nesting and feeding habits of the insects, and their relations to the coccids, are very largely determined by the structure and arrangement of the vegetative tissues during different stages in the development of the petiole and rachis."—*B. W. Wells.*

5737. Bugnon, P. **Sur le nombre des cotylédons de la Ficaire. [The number of the cotyledons of Ficaria.]** Compt. Rend. Acad. Sci. Paris **176**: 766–769. 1923.—*Ficaria ranunculoides* has sometimes been considered as having no cotyledons; at other times, as having 1 cotyledon; and finally, as having 2 cotyledons. A careful description is here given of the embryo, and the various theories and their bases are discussed. It is concluded that there are 2 foliar organs having the same anatomic connections with the root as the 2 cotyledons of the species of the same family which are obviously dicotyledonous. The most plausible hypothesis seems to be that this species is heterocotyledonous, one cotyledon being better developed than the other.—*C. H. Farr.*

5738. Burkill, I. H. **Notes on Dipterocarps; No. 9. On the differences in the seedlings between Balanocarpus maximus King and B. Heimii King.** Jour. Malayan Branch Roy. Asiatic Soc. **1**: 218–222. *Fig. 1–10.* 1923.—The seeds and seedlings of *B. maximus* are here described for the 1st time; those of *B. Heimii* were described under the name *B. maximus* (see Bot. Absts. 6, Entry 1896). The cotyledons of *B. maximus* are not markedly dissimilar, as are those of *B. Heimii;* they are packed parallel in the seed, and are of about equal length. The

1st leaves of the seedling are a pair (4 or 5 together in *B. Heimii*) and the youngest plant is purplish. The fruit is not dehiscent in either species, but is ruptured irregularly.—*R. E. Holttum.*

5739. Clute, Willard N. **The flowers of the magnolia.** Amer. Bot. 29: 45–47. 1923.

5740. Debbarman, P. M. **A case of axial proliferation of the flower of Nymphaea rubra Roxb.** Jour. Indian Bot. 3: 66–67. *1 pl.* 1922.—The ovary was transformed into a hard hairy mass, and a short stalk bearing a rudimentary flower grew out from the axil of a petal.—*Winfield Dudgeon.*

5741. Debbarman, P. M. **Some observations on the anchoring pads of Gymnopetalum cochinchinensis Kurz and some other Cucurbitaceous plants.** Jour. Indian Bot. 3: 52-57. *1 pl.* 1922.—Under normal conditions the branching tendrils twine in the usual manner, without pad formation; but when coming into contact with a surface, the tendril tips respond to the contact stimulus and produce 2–5-celled trichomes which wedge into minute crevices and anchor the plant mechanically. There is no evidence of attachment by a mucilaginous secretion. Shade and moisture favor pad formation, and strong light and drought inhibit it. *Trichosanthes palmata* possesses similar anchoring pads.—*Winfield Dudgeon.*

5742. Dudgeon, Winfield. [Rev. of: Mascrè, M. **Recherches sur le developpement de l'anthère chez les Solanacées.** (Studies in the development of the anther in Solanaceae.) Thèse, Paris. *99 p., 101 fig.* 1921.] Jour. Indian Bot. 3: 26–27. 1922.

5743. F[yson], P. F. [Rev of: Arber, Agnes. **Leaves of the Farinosae.** Bot. Gaz. 74: 80–94. 1922.] Jour. Indian Bot. 3: 156. 1923.

5744. F[yson], P. F. [Rev. of: Arber, A. **On the development and morphology of the leaves of the palms.** Proc. Roy. Soc. London, B. 93: 249–261. 1922.] Jour. Indian Bot. 3: 156–157. 1923.

5745. F[yson], P. F. [Rev. of: Arber, Agnes. **On the nature of the blade in certain monocotyledonous leaves.** Ann. Bot. 36: 320–351. 1922 (see Bot. Absts. 12, Entry 1106).] Jour. Indian Bot. 3: 155–156. 1923.

5746. Ghose, S. L. **An example of leaf-enation in Allium ursinum L.** New Phytol. 22: 49–58. *Fig. 1–10.* 1923.—In an abnormal leaf of *Allium ursinum* "doubling" was found in both the laminar and petiolar regions. Each blade shows one series of bundles, the orientation of which is opposite as is usual in leaf-enations. An example of leaf-enation is also described from *Xanthosoma appendiculatum.* A theoretical discussion is appended.—*I. F. Lewis.*

5747. Hallberg, F. **Notes on Indian plant teratology.** Jour. Indian Bot. 3: 1–9. *6 fig.* 1922.—Abnormalities in flowers of *Calycopteris floribunda* Lamk. and *Habenaria grandiflora* Lindl. are described and figured.—*Winfield Dudgeon.*

5748. Pfeiffer, H. **Vergleichende Anatomie der Blätter der Lagenocarpus-Arten.** [A comparison of the leaf anatomy of the species of Lagenocarpus.] Beih. Bot. Centrabl. 2 Abt. 39: 436–445. *Pl. 1.* 1923.—Small sections of the leaf are sufficient to identify species. It may be possible to group the species in sections on morphological characters.—*L. Pace.*

5749. Prouty, William F. **A more phenomenal shoot.** Jour. Elisha Mitchell Sci. Soc. 37: 15. 1921.—A shoot of 1 season's growth of *Pawlonia tomentosa* was shown that was 21½ feet high, 10 inches thick at base, and had 24 internodes.—*W. C. Coker.*

5750. Robertson, Charles. **Flowers and insects. XXIII. Pollination.** Bot. Gaz. 75: 60–74. 1923—A summary is given of terms and their definitions which are related to pollination conditions. These terms are chiefly those of early authors, such as "adynamandry" of Kölreuter, referring to self-sterility. The author believes that the original flowers are perfect and entomophilous, and that in the evolution of angiosperms probably the most important condition was the diversification of station and habitat.—*B. W. Wells.*

5751. Saxton, W. T. **Preliminary note on the life history of Cedrus deodara Loud.** Jour. Indian Bot. 3: 90. 1922.—Pollination occurs about the end of September (in the Himalayas) and fertilization about the end of May, 8 months later. Considerable spongy tissue is formed as the ovule develops. The female gametophyte at fertilization time is composed of exceedingly delicate tissue (more so than in *Pinus*). There are usually 3 archegonia, but occasionally as many as 6. The neck is variable, but is always composed of a considerable number of cells. The proembryo resembles that of *Pinus*, and the embryo is polycotyledonous.—*Winfield Dudgeon.*

5752. Soar, Isabel. **The structure and the function of the endodermis in the leaves of the Abietineae.** New Phytol. 21: 269–292. *Fig. 1–12.* 1922.—Methods for distinguishing suberin, lignocellulose, and cellulose are given. The material used included *Pinus* spp., *Picea excelsa, Pseudotsuga Douglasii, Larix europaea, Abies pectinata, Tsuga canadensis*, and *Pseudolarix Kaempferi*. Detailed study of leaf sections leads to the following conclusions. "The endodermis * * * has been shown to conform to a general plan, suberisation occurring always on the radial walls which are pitted, and on the transverse walls which are unpitted. The suberin is always deposited as a layer on each side of a lignocellulose core. The structure of the tangential walls varies in the different species described. They are often both lignified and suberised, but sometimes they, especially the inner tangential walls, consist of cellulose. Where these walls are suberised pits or breaks in the suberised membrane are present. In young leaves of *Pinus sylvestris* the development of the endodermal walls proceeds as follows: (1) cellulose, (2) lignocellulose, (3) lignocellulose with a surface layer of suberin. Thickening develops first in the radial walls. When the endodermal sheath is incomplete additional protective tissues are often found. Thus the growing leaf base of *Pinus* is protected by sclerotic scales, and the basal region of the leaf in *Picea* and *Abies* by additional layers of lignified hypoderma. The suberisation and lignification of the radial walls renders the endodermis relatively impervious to the passage of water through the walls alone. Thus the transpiration current must flow largely through the endodermal cell, and it is probable that the protoplasm exerts some control over the rate of flow." It is suggested that "the peculiar structure of the endodermis in the leaves of these gymnosperms is one of the factors which serve to retard transpiration."—*I. F. Lewis.*

5753. Williams, C. F. **The stems of grape hybrids.** Jour. Elisha Mitchell Sci. Soc. 38: 11–12. 1922.—The pattern of the phloem tissue and the character of the cork cambium were found to be specific in *Vitis vinifera* and *V. rotundifolia*. The F_1 hybrids of these 2 species showed intermediate characters of great variation, especially in regard to cork cambium.—*W. C. Coker.*

5754. Yocum, L. Edwin. **Some phases of structure and development of garden peas and white sweet clover seeds as related to hardness.** Jour. Elisha Mitchell Sci. Soc. 38: 76–83. *2 pl.* 1922.—"In sweet clover and garden peas the Malpighian layer of cells begins to thicken very much about a week after fertilization. Thickenings are in ridges leaving crevices between. Sweet clover develops a light line which is more impermeable to water than the outer part of the cell. The pea does not have this region but in some cases has an impermeable cutin. Pectin is deposited in the cells around the micropyle at about the time of fertilization in the garden pea. The outer portion of the Malpighian cells of sweet clover and garden peas is a hemi-cellulose, very likely some form of pentose. The inner portion is cellulose.—The impermeable portion of a hard pea seed is located in the cutinized layer as compared with the light line in sweet clover."—*W. C. Coker.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See in this issue Entries 5443, 5923, 5954, 6036, 6099)

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entry 6036)

5755. Anonymous. [Note.] Rev. Bryologique 50: 16. 1923.—Attention is called to a meeting of the Botanical Society of France held in the Jura during the summer of 1919. Bryologists were represented by Hétier and Hillier, who pointed out a number of interesting mosses and hepatics in the region.—*A. W. Evans.*

5756. Andrews, A. Le Roy. [Rev. of: Györffy, István. **A Molendoák fajai tagolódása és rokonsága összehasonlító anatomiai és fejlödéstani vizsgálatok alapján. (Investigations on Molendoa.)** Math. Term. Tud. Ert. 38: 344–351. 1921 (see Bot. Absts. 12, Entry 5763.] Bryologist 25: 108–109. 1922.—The reviewer outlines the general content of the article, commends the author's methods, and expresses the hope that the completed monograph will do much to clarify a little known region of the moss-system.—*E. B. Chamberlain.*

5757. Arnell, H. Wilh. **Bryum (Cladodium) vestmannum Arnell, nova species.** Bot. Notiser 1923: 293, 294. 1923.—The species here proposed as new was based on material collected in the province of Vastmanland, Sweden, by C. A. Törnlund in 1920. There is included under it a var. *norbergense* Arnell from the same province, described in 1918 as *Bryum inclinatum* var. *norbergense* Arnell (see Bot. Absts. 7, Entry 1079).—*A. W. Evans.*

5758. Brinkman, A. H. **List of British Columbia hepatics.** Canadian Field Nat. 37: 94–96. 1923.—A list of 170 hepatics compiled from various sources is given, no definite localities being mentioned. The list includes 31 species first discovered in British Columbia by the author.—*W. H. Emig.*

5759. Culmann, P. **Contribution à la flore bryologique du bassin supérieur de l'Alagnon (Cantal).** [Contribution to the bryological flora of the upper valley of the Alagnon (Cantal).] Rev. Bryologique 50: 9–15. 1923.—The region is in the department of Cantal in Central France, especial attention having been paid to a series of mountain ravines. The rocks of the district are largely volcanic, but gneiss and limestone are present in certain localities, and calciphilous species are found in some of the volcanic habitats. The species reported includes not only those found by the author but also those recorded in earlier works, particularly Héribaud's Muscinées d'Auvergne, published in 1899. In the present portion of the paper, which is to be continued, 39 hepatics are listed with full data regarding stations. A few critical remarks are interspersed and, in connection with *Marsupella Sprucei* and *M. ustulata*, the differential characters are discussed at length, the conclusion being reached that these are too vague and inconstant to separate the species.—*A. W. Evans.*

5760. Dixon, H. N. **Porotrichum angustifolium in Ireland.** Irish Nat. 32: 45–47. 1923.—This endemic British moss, originally found in Derbyshire, has been recorded from Ireland, probably from County Antrim.—*W. E. Praeger.*

5761. Fleischer, Max. **Kritische Revision von Carl Müllerschen Laubmoosgattungen.** [Critical revision of Carl Müller's genera of mosses.] Hedwigia 63: 209–216. 1922.—In the present part the same plan is followed as in the preceding part [see Bot. Absts. 8, Entry 447],

Müller's determinations being given in one column and the author's in another. The following genera as understood by Müller are taken up: *Remyella, Lindigia, Gyrosine, Patellidium, Campylodontium, Platygyrium, Struckia, Pylaisia, Entodon, Pilosium, Cyathophorum, Cyathophorella, Mononeurium, Euglossophyllum, Hypopterygium, Mniadelphus, Hepaticina, Hookeria,* and *Lepidophyllum.* As in the preceding part several of Müller's species are reduced to synonymy, and many new combinations are made necessary by the transference of species.—*A. W. Evans.*

5762. Gola, G. **Le epatiche raccolte dal Dott. G. B. De Gaspari nella Terra del Fuoco sud-occidentale.** [The hepatics collected by Dr. G. B. De Gaspari in southwestern Tierra del Fuego.] Nuovo Gior. Bot. Ital. 29: 162–175. *Pl. 1, 2.* 1923.—The present report is based on a collection made in the colder parts of Tierra del Fuego, many of the specimens having been found in the vicinity of glaciers and the streams flowing from them. The species in condition to be determined number 74 of which the following 17 are proposed as new and figured: *Anastrophyllum Pampininii, Blepharostoma acanthifolium, B. Pigafettoanum, Cephalozia (Cephaloziella) magellanica, Frullania (Diastoloba) microcaulis, Jamesoniella fuegiensis, J. glacialis, Lophocolea atra, L. Baccarinii, Lophozia magellanica, Plagiochila De Gasparii, P. marginata, P. microdonta, Riccardia laminaris, Schistochila De Gasparii, S. spinosissimum,* and *Solenostoma fuegiense.* In addition to these a new variety is described under each of the following species: *Isotachis georgiensis, I. subtrifida,* and *Lepicolea Scolopendra.* For *Plagiochila remotidens* Steph. the older name *P. ambigua* De Not. is taken up. Under each of the species listed the usual data regarding stations are given.—*A. W. Evans.*

5763. Györffy, István. **A Molendoák fajai tagolódása és rokonsága összehasonlító anatomiai és fejlödéstani vizsgálatok alapján.** [Investigations on Molendoa.] Math. Term. Tud. Ert. 38: 344–351. 1921.—The paper deals with the problematical moss-genus *Molendoa* and is preliminary to a more complete monograph (Versuch einer Monographie der Gattung Molendoa), which the author has nearly ready for publication. Ten previously described species are to be recognized, together with 7 new ones, the names of which alone are here given. The 3 European species are connected by rare transitional forms, and the relationship of all the forms of these species is represented graphically by a diagram. The author speaks also of forms appearing somewhat intermediate between *Molendoa* and *Hymenostylium* and thinks that the relationship between these two genera is closer than between *Molendoa* and *Anoectangium.* [See also Bot. Absts. 12, Entry 5756.]—*A. Le Roy Andrews.*

5764. Haupt, Arthur W. **Embryogeny and sporogenesis in Reboulia hemisphaerica.** Bot. Gaz. 71: 446–453. *Pl. 33, 11 fig.* 1921.—The material was collected at Hamilton and Dakota, Illinois, and at Rome, Indiana. In the development of the sporophyte the epibasal segment gives rise to the capsule and stalk, while the hypobasal segment gives rise to the foot. No octant stage is formed, as in certain other Marchantiaceae, but the epibasal segment usually divides by 2 transverse walls, before vertical walls are laid down, the young sporophyte thus consisting of a row of 4 cells. These results are in essential agreement with those recently reported by Woodburn (see Bot. Absts. 4, Entry 1045). In the later stages the sporogenous tissue is soon delimited from the amphithecum and gives rise directly, after a series of divisions, to spore mother cells and elater primordial cells, which are thus homologous structures. The walls of the sporogenous cells break down into a mucilaginous mass and the protoplasts of the spore mother cells exhibit an amoeboid movement before forming new cell walls. In the tetrad stage the walls become differentiated into intine and exine and an epispore, which finally gives rise to a "tuberculate" spore-surface, is laid down on the outside. In the elaters the development of the 2 spiral bands "is accompanied by a condensation and ultimate disappearance of the protoplasm."—*A. W. Evans.*

5765. Haupt, Arthur W. **Gametophyte and sex organs of Reboulia hemisphaerica.** Bot. Gaz. 71: 61–74. *21 fig.* 1921.—The material was collected at Rome, Indiana, by W. J. G. Land. The author recognizes a single species of *Reboulia,* the polymorphic *R. hemi-*

sphaerica. The thallus grows by means of a cuneate apical cell and bears 2-ranked ventral scales without appendages. The primary air spaces originate by centripetal splittings and become subdivided by secondary partitions. The pores opening into the chambers are simple on the vegetative thallus and male receptacle but barrel-shaped on the female receptacle. On the sessile male receptacle the antheridia develop in acropetal succession according to the method characteristic of the Marchantiales. On the stalked female receptacle several growing points are organized, each of which usually gives rise to a single archegonium, more rarely 2. In the development of the archegonium the initial divides by a transverse wall, the outer cell then dividng by 3 vertical walls in the usual way; the neck canal cells number 18–20 at maturity.—*A. W. Evans.*

5766. Henry, R. **L'abbé Boulay et l'étude des Sphaignes françaises.** [Abbé Boulay and the study of the French Sphagna.] Rev. Bryologique **50**: 1–4. 1923.—The author quotes passages from Boulay's letters, dating from 1904 and 1905, in which certain species of *Sphagnum* are discussed. These passages bring out the fact that Boulay regarded as non-valid many of the species proposed by Warmstorf and other recent bryologists.—*A. W. Evans.*

5767. Kashyap, Shiv Ram. **A long-lost liverwort.** Jour. Indian Bot. Soc. **3**: 181. 1923. —In 1849 Griffith described and figured a curious liverwort from Assam under the name *Monoselenium tenerum*. Goebel in 1910 described an apparently identical plant from Canton, China. It has now been rediscovered in Manipur, Assam.—*Winfield Dudgeon.*

5768. Kashyap, Shiv Ram, and Shiva Kant Pande. **A contribution to the life-history of Aneura indica St.** Jour. Indian Bot. Soc. **3**: 79–89. *Pl. 1–7*. 1922.—*Aneura indica*, one of the few Indian species of *Aneura*, is very variable in the shape and structure of the thallus and in the form of the upper epidermal cells. It is strictly dioecious, the development of the sex organs agreeing with the descriptions of Campbell and Clapp. The sporophyte remains enclosed by the calyptra till a late stage. The elaterophore extends to about the middle of the capsule, and the elaters are attached in a spreading manner. A mature sporophyte had a seta 6 mm. long and a cylindrical capsule 2.5 mm. long. The capsule wall is 2-layered, and the cells of both layers possess broad, brown, annular bands. The spores are 20–30 μ in diameter, and the elaters are about 19 μ long, with a single broad spiral band. The chromosome numbers are 6 and 12.—*Winfield Dudgeon.*

5769. Röll, Julius. **Torfmoose der Niederlausitz.** [Peat mosses of the Lower Lausitz.] Hedwigia **64**: 19–29. 1922.—The present report is based on 2 collections of *Sphagnum* made by the author in June, 1920, in the Lower Lausitz, a district of southern Prussia just north of Saxony. The prevailing vascular plants of the localities investigated are briefly indicated, and the peat mosses collected are listed in detail, definite stations being given in each case. The lists include 26 distinct species of *Sphagnum*, together with numerous varieties and forms.—*A. W. Evans.*

5770. Thériot, I. **Gyroweisia ou Weisiodon?** Rev. Bryologique **50**: 4–6. 1923— Reference is made to a recent paper by Andrews (see Bot. Absts. 12, Entry 4167), in which it is shown that the generic name *Gyroweisia* Schimp., being antedated by *Weisiodon* Schimp., ought to be discarded according to the current rules of nomenclature. Since, however, *Gyroweisia* has been in use for many years and since Schimper himself preferred it to *Weisiodon*, it is recommended that an exception to the rules be made and that the name *Gyroweisia* be retained.—*A. W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

Donald S. Welch, *Assistant Editor*

(See also in this issue Entries 5471, 5816, 5817, 5821, 5825, 5826, 5827, 5832, 5833, 5834, 5836, 5842, 5844, 5845, 5849, 5892, 5898, 5924, 5947, 5975, 5982, 5998, 6032)

FUNGI

5771. Allen, W. B. [Rev. of Rea, Carleton. **British Basidiomycetae, a handbook of the larger British fungi.** *xii* + *799 p.* Cambridge University Press: 1922 (see Bot. Absts. 12, Entry 1978).] Trans. British Mycol. Soc. 8: 254–256. 1923. [See also Bot. Absts. 12, Entry 5049.]

5772. Bathellier, Jean. **Sur les jardins à champignons de l'Eutermes Matangensis.** [On the fungous gardens of Eutermes Matagensis.] Compt. Rend. Acad. Sci. Paris 176: 129–131. 1923.—The fungus which is so cultivated is found to be a Xylaria.—*C. H. Farr.*

5773. Bose, S. R. **Geographical distribution of the Bengal species of Polyporaceae along with a short history of them in Bengal.** Jour. Indian. Bot. 3: 19–21. 1922.—Incomplete knowledge of the fungus flora of the world renders a general view of distribution impossible. Polyporaceae apparently are widespread wherever conditions are suitable. Among the Bengal Polyporaceae some are practically cosmopolitan, as *Fomes leucophaeus, Polystictus versicolor, Ganoderma lucidus,* and *Polyporus gilvus;* others appear to have a strikingly discontinuous distribution, as *Polystictus protea, Trametes lactinea, T. occidentalis, Daedalea quercina,* and *Polyporus luzonensis;* others are restricted to British India and the eastern tropics, as *Polystictus Berkleyi, P. suboccidentalis, Polyporus Emerici, P. fumoso-olivaceus, Merulius similis,* and *Fomes annularis;* and recent discoveries in Bengal extend the known range of distribution of several species, as *Lenzites alutacea, Polyporus Rhizophore, P. anebus,* and others.—A brief review is given of the scattered and fragmentary literature on Bengal Polyporaceae.—*Winfield Dudgeon.*

5774. Chardon, Carlos E. **Un nuevo "smut" de Puerto Rico.** [A smut new to Porto Rico.] Rev. Agric. Puerto Rico 6⁴: 21–23. *1 fig.* 1921.—*Thecaphora pustulata* Clinton attacking *Bidens leucantha* in Porto Rico is described as new to the Island. The fungus deforms the leaves and stems of the host.—*John A. Stevenson.*

5775. Christiansen, M. **General Mukormykose hos Svin.** [General mucormycosis in swine]. K. Vet. og. Landbohoejskoles Aarsskr. 1922: 131–191. *2 pl., fig 1–11.* 1922.—*Rhizopus* (*equinus* Const. & Lucet. ?) and *Absidia ramosa* var. *Rasti* Lendner have been isolated from peritoneal and other tumors of swine. Rabbits have been successfully infected with pure cultures. A German summary is given.—*Ernst Gram.*

5776. Coker, W. C. **Some fungi new to North America or the South.** Jour. Elisha Mitchell Sci. Soc. 37: 13–14. 1921.—The following are reported from Chapel Hill, North Carolina: *Sirobasidium sanguineum, Pholiota praecox* (a remarkable form of this species lacking the veil), *Tricholoma venenata, Lepiota caerulescens, Apodachlya brachynema.*—*W. C. Coker.*

5777. Coker, W. C., and H. C. Beardslee. **The Collybias of North Carolina.** Jour. Elisha Mitchell Sci. Soc. 37: 83–107. *Pl. 1 (col.), 4–23.* 1921.—Twenty-two species are treated with *C. lilacina* described as new.—*W. C. Coker.*

5778. Coker, W. C., and H. C. Beardslee. **The Laccarias and Clitocybes of North Carolina.** Jour. Elisha Mitchell Sci. Soc. 38: 98–126. *Pl. 1.* (col.), 7–33. 1922.—Four species of *Laccaria* and 20 of *Clitocybe* are keyed and described.—*W. C. Coker.*

5779. Coker, W. C., and F. A. Grant. **A new genus of water mold related to Blastocladia.** Jour. Elisha Mitchell Sci. Soc. 37: 180–182. *Pl. 32.* 1922.—This plant (**Septocladia** *dichotoma* Coker and Grant) was found on a piece of bone in a pool at Chapel Hill, North Carolina. It differs from *Blastocladia* in possessing a septate thallus.—*H. M. Fitzpatrick.*

5780. Eichelbaum, F. **Die essbaren Pilze der Niederelbe und Trave. Zweites Stück. [The edible fungi of the Lower Elbe and the Trave. Second part.]** Verhandl. Naturw. Ver. Hamburg **III,** 26: 1–28. 1918 [1919].—The 1st part of this work was published in 1917 (see these transactions **III,** 24: 101–132. 1916 [1917]) and called attention to the greatly increased interest in the edible mushrooms among the German populace during the war. The author there attempted to supply the southern part of Schleswig-Holstein with a list of species that he had personally tested with respect to edibility. This list includes 5 ascomycetes and 101 basidiomycetes. Under each he described the habitat, the degree of frequency, and the distinctive features (especially in the case of those likely to be confused with poisonous forms), and gave both Latin and German names, adding references to published illustrations as far as possible. —In the 2nd part he gives a similar list of 103 additional species which he has subsequently tested. Of non-edible or otherwise objectionable species he recognizes 7 groups, as follows: (1) those containing a single non-volatile poison, not destroyed by boiling or drying; (2) those containing 2 such poisons, sometimes but not always counteracting each other; (3) those usually harmless but said to act poisonously sometimes; (4) those containing a volatile poison, destroyed by boiling; (5), those which are bitter when fresh, the bitterness disappearing upon boiling; (6) those which are edible only while young; and (7) those which are objectionable on account of bad taste or odor. The list includes representatives of all these groups except the 1st and 2nd.—*A. W. Evans.*

5781. Elliott, Jessie S. Bayliss, and Olive P. Stansfield. **Records of Fungi Imperfecti.** Trans. British Mycol. Soc. 8: 249–254. *Fig. 1–4.* 1923.—*Septocylindrium leucum, S. melleum, Patellina caesia,* and *P. diaphana* are described as new species. Several other species that are new to the British Isles or are rare are discussed.—*W. B. McDougall.*

5782. F[yson], P. F. [Rev. of: Bose, S. R. **One new species of Polyporaceae and some polypores of Bengal.** Ann. Mycologici 19: 129–131. 1921. (see Bot. Absts. 12, Entry 1954).] Jour. Indian Bot. 3: 155. 1923.

5783. Hawley, H. C. **Notes on some British pyrenomycetes.** Trans. British Mycol. Soc. 8: 226–230. 1923.—This paper consists of short notes on 19 pyrenomycetes, 9 of which are new to the British Isles.—*W. B. McDougall.*

5784. Higgins, B. B. **Notes on the morphology and systematic relationship of Sclerotium Rolfsii Sacc.** Jour. Elisha Mitchell Sci. Soc. 37: 167–172. *Pl. 29.* 1922.—No fruiting bodies are known but an affinity to the basidiomycetes is indicated by the septate, binucleate mycelium and by the presence of clamp connections. On fleshy plants, such as cantaloupe, growth is profuse and sclerotia are abundantly formed. The mature sclerotia are 0.5–1.5 mm. thick, with a thin corky surface layer, a parenchymatous subcortical layer, and a filamentous central region. On nutrient media the inner filaments sprout through the outer layers to renew mycelial growth. Cultures from different sclerotia allowed to intermingle showed that mixing of strains was not necessary for the production of sclerotia. When dry the sclerotia remain viable for more than 2 years, but it is thought that they do not survive long on moist earth in the field.—*W. C. Coker.*

5785. Knudsen, S. **Om Gær og Skimmel i sukret kondenseret Mælk. [Yeasts and molds in sweetened condensed milk.]** K. Vet. og. Landbohoejskoles Aarsskr. **1922:** 282–295. 1922.—In Danish sweet condensed milk a yeast was found, and in Dutch sweet condensed milk 2 yeasts, presumably identical with those described by Pethybridge from Irish condensed milk.

by Miss Hiscox from English condensed milk, and similar to one found by Hammer in American condensed milk. *Aspergillus glaucus* and *Catenularia fuliginea* by their autodigestion cause the formation of "buttons" in condensed milk.—*Ernst Gram.*

5786. Léger, L., et E. Hesse. **Sur un champignon du type Ichthyophonus parasite de l'intestin de la Truite.** [A fungus of the Ichthyophonus type parasitic on the intestines of trout.] Compt. Rend. Acad. Sci. Paris 176: 420–422. 1923.—A new species, *Ichthyophonus intestinalis*, is described. It is found throughout the digestive tract. Its life history in relation to that of the trout is discussed.—*C. H. Farr.*

5787. McLean, R. C. **A new species of Sigmoideomyces Thaxter.** Trans. British Mycol. Soc. 8: 244–246. *Pl. 12.* 1923.—*Sigmoideomyces divaricatus*, found on the surface of soil in a pot in the greenhouse at University College, Cardiff, is described as new. This is the 3rd species of the genus to be described, the 1st being *S. dispiroides* Thaxter from Tennessee and the 2nd *S. clathroides* described by Mrs. Bayliss Elliott from Birmingham. *S. clathroides* was found by Mrs. Elliott to be correlated with the presence of dead earthworms in the soil but no such connection was found in the case of *S. divaricatus.*—*W. B. McDougall.*

5788. Mounce, Irene. **The production of fruit-bodies of Coprinus comatus in laboratory cultures.** Trans. British Mycol. Soc. 8: 221–226. 1923.—Attempts to obtain fruit-bodies in cultures of horse dung were unsuccessful; but when the mycelium was grown upon a sterilized mixture of horse dung and sawdust buried beneath a thick layer of soil at the bottom of deep culture vessels perfect fruit-bodies were obtained in 9–10 months.—*W. B. McDougall.*

5789. Petch, T. **Parasites of scale-insect fungi.** Trans. British Mycol. Soc. 8: 206–212. *3 fig.* 1923.—Three genera of fungi which are parasitic on entomogenous fungi are discussed. The following species are described as new: *Sirosphaera chlorostoma*, *Sirosperma sparsum*, *Byssostilbe fusca*, and *B. tomentosa.*—*W. B. McDougall.*

5790. Petch, T. **The genus Cladosterigma Pat.** Trans. British Mycol. Soc. 8: 212–215. 1923.—*Microcera Clavariella* Speg. is a Cladosterigma and seems to be identical with *C. fusisporum*. It must therefore be known as *Cladosterigma Clavariella*. A new genus, **Trichosterigma**, of the family Stilbaceae, is described to accomodate 3 species of entomogenous fungi found in Ceylon. These 3 species are described as new with the following names: *Trichosterigma clavisporum*, *T. arachnophilum*, and *T. attenuatum.*—*W. B. McDougall.*

5791. Stratton, Robert. **The Fimetariales of Ohio. (The Ascomycetes of Ohio. III.)** Ohio Biol. Surv. 3: 75–144. *Pl. 1–18.* [Ohio State Univ. Bull. 26: no. 5.] 1921.—No previous study of the species growing in Ohio had been made, and only a single species had been recorded for the State. Collections of dung of various animals were sent in by 12 persons from as many different localities. Cultures were made in moist chambers, and the species described were grown, for the most part, in these cultures, These species are 6 from the genus *Chaetomium* of the Chaetomiaceae; and 6 of *Fimetaria*, 14 of *Pleurage*, 2 of *Delitschia*, and 6 of *Sporormia* of the Fimetariaceae. New species are: *Fimetaria tetraspora*, *F. pilosa*, *Pleurage hyalopilosa*, and *P. immersa*. The diagnoses are accompanied by keys. The 18 plates contain more than 200 figures. Glossary, bibliography, and index are appended.—*Bruce Fink.*

5792. Ulbrich, E. **Stropharia viridula Schaef. var. exanulosa Ulbrich n. var.** Hedwigia 63: 217–218. 1922.—The plant was found in the Berlin Botanical Garden, and in areas near the city, growing on stumps and on decaying vegetable matter in soil. The annulus, a constant character of the parent species, is absent in the variety. A partial veil is present in young specimens, but this adheres to the margin of the pileus as the pileus expands. The stipe and the pileus are larger than in the species. Other minor points of difference are included in the 12-line description.—*Bruce Fink.*

5793. Wakefield, E. M., and A. A. Pearson. **Some additional records of Surrey resupinate hymenomycetes.** Trans. British Mycol. Soc. 8: 216–221. *Fig. 1–8.* 1923.—Several species of resupinate fungi are described and discussed and *Tulasnella allantospora* and *T. microspora* are described as new.—*W. B. McDougall.*

5794. Weir, James R. **Poria papyracea (Schw.) Cke.** Phytopathology 13: 187. 1923.—Several collections of this rare fungus are reported.—*B. B. Higgins.*

5795. Wolf, Frederick A. **The fruiting stage of the Tuckahoe, Pachyma cocos.** Jour. Elisha Mitchell Sci. Soc. 38: 127–137. *Pl. 34–37.* 1922.—The well known but puzzling Tuckahoe is shown to be the sclerotium of a Poria and is given the name *Poria cocos.* Fruiting surfaces were obtained on fresh sclerotia after soaking and exposure to light. Fruiting was also obtained on the surface of pieces of the inside of the sclerotia which were placed in test tubes. The development of the sclerotia inside the pine roots is described.—*W. C. Coker.*

5796. Zikes, Henrich. **Über die Perithizenbildung bei Aspergillus Oryzae. [The formation of perithecia in Aspergillus Oryzae.]** Centralbl. Bakt. II Abt. 56: 339–343. *Fig. 1–3.* 1922.—Mature perithecia of *Aspergillus Oryzae* were produced when growing the fungus on a gelatin medium prepared according to Woltje's formula. The conidial stage was again obtained by growing single ascospore cultures on sugar media. The fungus was also studied on various modifications of Woltje's medium. In this connection budding structures were observed.—*Anthony Berg.*

LICHENS

5797. Herzog, Th. von. **Beitrag zur Flechtenflora von Bolivia. [Contribution to the lichen flora of Bolivia.]** Hedwigia 63: 263–268. 1922.—The lichens considered are part of a general collection of plants made in 1910 and 1911, and were determined by Zahlbruckner. Sixty-three species and subspecies are listed with localities, substrata, and occasionally other data. *Cladonia gracilis polyclada* Zahlbr. is described as new. Since little is known of the lichen flora of the area, the contribution is of special interest to lichenists and phytogeographers.—*Bruce Fink.*

5798. Hillman, Johannes. **Übersicht über die Arten der Flechtengattung Xanthoria (Th. Fr.) Arn. [A survey of the species of the lichen genus Xanthoria.]** Hedwigia 63: 198–208. 1922.—A key is given followed by descriptions and notes on distribution of the 10 known species, together with a considerable number of subspecies. *Xanthoria parietina* (L.) Th. Fr. and *X. candelaria* (L.) Arn. are distributed over all the grand divisions of the earth; *X. polycarpa* (Hoffm.) Flag. is found in Europe, Africa, and America; *X. fallax* (Hepp) Arn., in Europe and Africa; *X. lobulata* (Floerke) Bouly de Lesd., in Europe; *X. spinulosa* (Krempelh.) Hillm., in Australia; *X. polycarpoides* Stizenb., in Asia; *X. flammea* (L.) Hillm., in Africa; and *X. ramulosa* (Tuck.) Hillm. and *X. modesta* Zahlbr. in America.—*Bruce Fink.*

5799. Smith, Annie Lorrain. **Recent work on lichens.** Trans. British Mycol. Soc. 8: 193–206. 1923.—This paper consists of a summary of the publications on lichens that were unavoidably omitted from the author's handbook, Lichens, and of those that have appeared since the handbook went to press. The paper closes with a bibliography of 44 titles.—*W. B. McDougall.*

BACTERIA

5800. Anonymous. [Rev. of: Lieske, Rudolph. **Bacterien und Strahlpilze. (Bacteria and Ray fungi.)** In: **Handbuch der Pflanzenanatomie.** Edited by K. Linsbauer. II Abt., 1 Teil: **Thallophyten**, Band 6. *iv + 88 p.* Gebrüder Borntraeger: Berlin, 1922.] Nature 111: 355. 1923.

5801. Conn, H. J. **General characteristics of the soil flora.** [Abstract.] Absts. Bact. 7: 84–85. 1923.

5802. Dudgeon, Winfield. [Rev. of: Heller, Hilda Hempl. **Phylogenetic position of bacteria.** Bot. Gaz. 72: 390–396. 1921.] Jour. Indian Bot. 3: 118. 1922.

5803. Löhnis, F., and N. R. Smith. **Studies upon the life cycles of bacteria—part II; life history of Azotobacter.** Jour. Agric. Res. 23: 401–423. *Pl. 1–9.* 1923.—Experimental tests with 30 strains of *Azotobacter* and several cultures of related bacteria show that only 2 species of this genus have been characterized thus far: *A. chroococcum* and *A. agile.* Members of this genus are characterized by 7 cell types differing physiologically as well as morphologically. These types are (1) large, non-sporulating, globular, oval or rod-like cells, white, yellow, or brown with polar or peritrichous flagella, able to act as gonidangia and microcysts; (2) coccoid cells, white, yellow or pink, the vegetative growth of regenerative cells; (3) dwarfed cell types, white, yellow, or red, the vegetative growth of the gonidia; (4) irregular, fungoid cells, yellow, orange, or white or pink; (5) small non-sporulating rods; (6) small sporulating rods; (7) large sporulating cells, white, yellow or brown. Many of these stages have been shown to be identical with previously described species. All types have been transformed into each other. The formation of symplasm and the regeneration of new cells proceed in the manner described in a previous article. The reproductive organs of *Azotobacter* are (1) gonidia; (2) regenerative bodies and exospores, produced in 2 ways, either in lateral or terminal positions, or from the symplasm; (3) arthospores formed from the rod-like or fungoid cells; (4) microcysts, a small globular resting cell; and (5) endospores. Gonidia form the basis for the development of regenerative bodies. Conjunction occurred regularly before the formation of gonidia, regenerative bodies, and both endospores and exospores.—*W. H. Burkholder.*

5804. Mildenberg, Hermann. **Über einen blauen Farbstoff bildenden Bacillus aus der Luft und seine Beziehungen zum Bacillus der blauen Milch** [A blue pigment-producing bacillus from the air and its relation to the bacillus of blue milk.] Centralbl. Bakt. II Abt. 56: 309–328. 1922.—This organism is compared in detail with *B. cyanogenus.* It differs in several respects from the blue pigment producers and is thought to be an undescribed organism. —*Anthony Berg.*

5805. Small, James C., and Louis A. Julianelle. **Biological and serologic studies of Bacillus mucosus group. Comparison of strains from granuloma inguinale with strains from respiratory tract.** Jour. Infect. Diseases 32: 456–470. 1923.—Numerous strains of bacteria of the mucosus group were studied morphologically, for biochemical reactions, for growth in the presence of tartar emetic, and for serologic reactions, with the view of differentiating the strains obtained from lesions of the respiratory tract from those from lesions of inguinal granuloma. The effects of tartar emetic on growth was the only test which distinguished them. Granuloma strains were more resistant to the growth-inhibiting effects of tartar emetic than were the respriatory strains. Lack of motility, presence of capsules, gram-negative staining, inability to produce indol from peptone, the absence of gelatin-liquifying properties, inability to produce creatinin from peptone, ability to reduce nitrates, and to form ammonia and amino-acids from peptone are characters common to the mucosus group, but not useful for identifying subgroups.—*R. L. Starkey.*

5806. Wolf, F. A. **Studies on fermentation of rare sugars by plant pathogenic bacteria.** Jour. Elisha Mitchell Sci. Soc. 38: 12–13. 1922.—"In the case of two leafspot diseases of tobacco commonly designated as wild-fire and angular leafspot caused by *Bacterium tabacum* and *B. angulatum* respectively, both are able to form acid from dextrose and saccharose but not from glycerine and lactose, but the former attacks in addition mannitol and galactose whereas the latter is without action on them. A similar specialization obtains in the case of two leafspot organisms, *Bacterium glycineum* and *B. sojae* from soybean. This study emphasizes the necessity of employing in phytopathological studies the rare sugars for diagnostic purposes." —*W. C. Coker.*

5807. Yuri, Etsuo. **Final hydrogen ion concentration in the paratyphoid enteritidis group.** Jour. Infect. Diseases 32: 479–480. 1923.—The final H-ion concentration of dextrose broth cultures could not be used to destinguish the several types of paratyphoid-enteritidis bacilli. The pH varied within narrow limits (4.6–4.9).—*R. L. Starkey.*

MYXOMYCETES

5808. Gunn, W. F. **Irish Mycetozoa.** Irish Nat. 29: 76. 1920.—*Lamproderma scintillans* and *Physarum staminipes* are each recorded for the 2nd time from Ireland.—*W. E. Praeger.*

5809. Vonwiller, P. **Über den Bau des Plasmas der niedersten Tiere. II. Lycogala epidendron.** [Structure of protoplasm of simplest animals.] Arch. Protistenk. 40: 1–15. *1 pl., 3 fig.* 1919.—A review of the literature is followed by a description of the microscopic structures of *Lycogala epidendron.*—An account of spore formation is included.—*R. P. Hall.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

(See also in this issue Entries 5457, 6036)

5810. Bandulska, H. **On the presence of an Abietinean conescale, Pityolepis durleyensis, sp. n. in the Bournemouth Eocene beds.** Ann. and Mag. Nat. Hist. 11: 705–707. *Fig. 1.* 1923.—A cone-scale belonging to the middle Eocene period was found at Durley Chine, Bournemouth. The points of similarity and difference between the fossil and cone-scales of living species of *Abies*, *Picea*, and *Pseudotsuga* are discussed. Since it does not quite agree with any one of these, the name *Pityolepis durleyensis* is suggested.—*H. H. Clum.*

5811. Berckhemer, Fritz. **Über die Böttinger Marmorspalte sowie über Funde fossiler Pflanzen aus einigen Tuffmaaren der Alb.** [The marble fissure at Böttingen and discoveries of fossil plants in some of the tufas of the Alb.] Jahresh. Ver. Vaterländ. Naturk. Württemberg 77: 66–78. *2 fig.* 1921.—The account of the marble at Böttingen is largely geological in character, but the author notes the occurrence of several angiospermous fossils, notably *Podogonium Knorri* Al. Br., as indicative of the Miocene. From the tufas of Grabenstatten, Hengen, Erkenbrechtsweiler, and other localities in the Alb district of southern Germany he describes and figures a well-preserved Juglans nut, perhaps referable to *J. nux taurinensis* Ad. Brong., and records the occurrence of 5 other dicotyledonous and 3 monocotyledonous genera.—*A. W. Evans.*

5812. Cockerell, T. D. A. [Rev. of: Knowlton, F. H. **The Laramie flora of the Denver Basin, with a review of the Laramie problem.** U. S. Geol. Surv. Professional Paper 130. *175 p., 28 pl.* 1922.] Torreya 23: 52–53. 1923.—The very complete historical summary brings out the fact that this area has a single distinct flora, existing under warm and moist conditions. The salient feature is the great representation of *Ficus*, with 40 species. *F. navicularis* Ckll. is re-named *F. Knowltoni* Ckll.—*J. C. Nelson.*

5813. Compton, R. H. **Botanical aspects of Wegener's hypothesis.** Nature 111: 533–534. 1923.—The author was quoted (Nature 111: 131) as regarding the evidence completely opposed to the theory. The ancient phyla are generally valueless as indicating former land connections, and the distribution of the modern groups took place at a later date; the botanical evidence therefore provides no test.—*O. A. Stevens.*

5814. F[yson], P. F. [Rev. of: Seward, A. C. **A study in contrasts: the past and present distribution of certain ferns.** Taken from the published minutes of the Linnean Society of London, for June 1st, 1922 (see Bot. Absts. 12, Entry 5112).] Jour. Indian Bot. 3: 121–123. 1922.

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash, *Assistant Editor*

(See also in this issue Entries 5290, 5292, 5297, 5302, 5304, 5309, 5310, 5312, 5316, 5317, 5320, 5341, 5342, 5344, 5350, 5356, 5364, 5369, 5372, 5734, 5407, 5471, 5507, 5522, 5530, 5555, 5565, 5567, 5571, 5578, 5614, 5621, 5623, 5627, 5628, 5642, 5643, 5654, 5659, 5667, 5677, 5697, 5699, 5714, 5736, 5740, 5747, 5774, 5775, 5784, 5794, 5795, 5806, 5936, 5938, 5973, 5975, 6000, 6004, 6030, 6031, 6032)

DISEASES CAUSED BY FUNGI

5815. Anonymous. **Panama disease.** Jour. Jamaica Agric. Soc. 26: 454–456. 1922.—The Panama disease of bananas, caused by *Fusarium cubense*, first appeared in Jamaica in 1911, being reported simultaneously from 3 localities. Control measures followed in Jamaica are as follows: diseased plants are dug up and burned; a ring of healthy plants about the diseased one is also dug up and destroyed; the area thus cleared is fenced and kept clear of plant growth, particularly of cocoes [*Colocasia*].—*John A. Stevenson.*

5816. Baez, Horacio. **La rulla o polvillo del trigo. [Wheat rust.]** Defensa Agric. [Uruguay] 3: 163–167. *5 fig.* 1922.—Black rust (*Puccinia graminis Tritici*) has been very severe on wheat in Uruguay during the past season. The disease appears in February and March and disappears in June. It comes from the south and passes on to Brazil.—The uredo stage only is found. The life-history of the fungus is described.—*John A. Stevenson.*

5817. Beauverie, J. **Sur les rapports existant entre le développement des rouilles du blé et le climat.** [The relation between climate and development of wheat rusts.] Compt. Rend. Acad. Sci. Paris 176: 529–531. 1923.—Three rusts, *Puccinia graminis, P. glumarum,* and *P. triticina* are studied. It is concluded that *P. glumarum* appears when the spring is damp; *P. triticina* is the rust of dry years; and *P. graminis,* of wet years. Lists of varieties are given under the following heads: very resistant; fairly resistant; susceptible; very susceptible; most susceptible.—*C. H. Farr.*

5818. Bioletti, Frederic T. **Make mildew scarce.** Associated Grower 3[6]: 7, 18. *3 fig.* 1922.—Grapevines affected with powdery mildew [*Uncinula necator* (Schw.) Burr.] should be sulphured: (1) when the young runners are about 10 inches long; (2) at blossoming time; (3) if necessary, after the grapes have set. The finest ground sulphur should be used, and applied evenly, not too heavily, and only when the leaves are dry.—*E. L. Overholser.*

5819. Burger, O. F., E. F. De Busk, and W. R. Briggs. **Preliminary report on controlling melanose and preparing Bordeaux-oil.** Florida Agric. Exp. Sta. Bull. 167. *123–140. Fig. 28–32.* 1923.—Melanose is very serious in Florida citrus groves, causing a large percentage of low-grade fruit. Stem-end rot is due to the same fungus, and causes much decay in transit. The fungus reproduces in the dead terminal twigs and branches and in the outer dead wood. Removing dead wood is highly recommended. The disease makes its appearance on leaves, twigs and fruit as small, hard, raised, reddish-brown spots scattered over the surface. These spots are generally round with a smooth glazed surface and in severe cases they often run together. The fruit may become streaked, giving a tear-stained appearance. When heavily infested the fruits are dwarfed, the leaves drop, and the young stems are covered with a hard brown crust. On the leaves and sometimes on fruits there are circular markings which are supposed to be formed in the following manner: Many spores held in a drop of water, soon lodge on the edge through surface tension. When the water evaporates these spores are deposited in a circle so as to form the peculiar markings mentioned. The disease is caused by *Phomopsis Citri.* The fungus cannot penetrate healthy bark; it must pass through a wound or natural opening. Young and growing tissues are susceptible. Fruit

becomes immune about the last of May. Bordeaux-oil spray has been used for experimental purposes with good results. A list of spray schedules for citrus trees is presented.—*J. C. Th. Uphof.*

5820. Clayton, Edward E. **The relation of temperature to the Fusarium wilt of the tomato.** Amer. Jour. Bot. **10:** 71–88. *Pl. 8–11, fig. 1.* 1923.—This is a study of the effect of air and soil temperature on the wilt disease of tomatoes caused by *Fusarium Lycopersici.* This fungus in pure culture showed a minimum temperature for growth of 9–10°C., an optimum of 28°C., and a maximum of 37°C. Tomato plants grew from 19 to 35°C., but thrived best at 24–31°C. The various symptoms are described as they appear under optimum temperature conditions, as well as somewhat above and below. Both host and parasite, taken individually, develop at wider ranges of temperature than does the disease itself. The fungus infests the vascular bundles, but death of the host is believed to be due to a toxic action of the fungus rather than to a plugging of the xylem ducts. When soil temperature alone was varied the optimum for the disease was about 28°C., while soil temperatures of 33°C. or above, or of 19°C. or below, inhibited the disease. Air temperature proved as effective in controlling the appearance of the disease as soil temperature. Only when the soil was kept warm (27°C.) and the air warm (27°C.) or hot (33°C.) did the disease develop rapidly. If the soil was kept too cool or too warm, the disease did not develop, even with optimum air temperature. In cool air and optimum soil temperature, heavy infection occurred in the root and base of the stem, but the plant continued to grow and there were no external disease symptoms. Sudden but temporary increases in air temperature seem to increase its virulence.—*E. W. Sinnott.*

5821. Curtis, K. M. **Two fungal diseases of the blue lupin.** New Zealand Jour. Agric. **26:** 240–246. *10 fig.* 1923.—A disease due to *Botrytis cinerea* and one presumably caused by *Ascochyta Pisi* are found attacking blue lupin. The Botrytis is most common on cultivated plants while the Ascochyta occurs chiefly on volunteer plants.—*N. J. Giddings.*

5822. Demaree, J. B. **Pecan scab experiments in 1922.** Amer. Nut Jour. **18:** 4. 1923.—Two applications of Bordeaux in late summer gave no immediate favorable results but delayed the appearance of the fungus the next year by preventing its hibernation on the twigs. At Baconton, Georgia, satisfactory control was obtained by spraying with 3–6–50 Bordeaux on June 13, with 4–6–50 Bordeaux on July 6, and following by 2 applications of 1–2–50 Bordeaux mixed with 1 gallon of concentrated lime sulphur on July 27 and Aug. 23. At De Witt, Georgia, the best results were obtained with 1–50 lime sulphur spray. The addition of 1 pound of dissolved $CuSO_4$ to each 50 gallons improved the sticking qualities. Bordeaux was more effective in controlling scab but injured the foliage. The cost of spraying was about 25 cents per application per tree. The addition of soap or casein to Bordeaux did not increase the adhering properties. Spraying was justified on plantings containing 7 or more trees.—*E. L. Overholser.*

5823. Detwiler, S. B. **Cooperative white pine blister rust control.** Monthly Bull. California Dept. Agric. **11:** 636–638. 1922.—There are quarantine laws prohibiting the shipment of 5-leaf pines and currant and gooseberry plants west of a line from Minnesota to Texas. Government inspectors examine packages to prevent shipment of prohibited plants. Infections of white pine blister rust dating from 1914 or earlier have been found in British Columbia and Washington. The disease is more disastrous to the western white pine than to the eastern white pine. Complete destruction of black currants in all pine-growing states would be advisable.—*E. L. Overholser.*

5824. Fawcett, G. L. **La "gomosis" de los naranjos. [Gummosis of oranges.]** Rev. Indust. y Agric. Tucuman **12:** 149–155. *5 fig.* 1922.—Two types of gummosis of citrus trees are recognized in Tucuman. The 1st attacks the trees at the soil level and below, working out along the main roots. This is the type commonly known as foot-rot and is especially

prevalent on seedlings. It is characterized by a rotting of the bark with more or less copious gum formation and is thought to be due to *Phytophthora terrestria* Sherb. Contributing factors are excessive moisture and improper cultivation. The diseased areas should be thoroughly cleaned out and the wounds treated with Bordeaux paste. As preventive measures sour orange or other resistant stocks should be used and care taken not to plant too deep.—The 2nd type is that known as "scaly bark" and appears in the upper part of the tree. Gumming may or may not be present. The cause is not known.—*John A. Stevenson.*

5825. Gilchrist, Grace G. **Bark canker disease of apple trees caused by Myxosporium corticolum Edgert.** Trans. British Mycol. Soc. 8: 230–243. *Pl. 9–11, 3 diagr.* 1923.—This disease is characterized by the formation of large longitudinal scars on the sides of apple-tree branches. In the dead tissues of these scars numerous acervuli are found. These scars increase rapidly only during 1 period each year. The fungus is most abundant in the cortex but occurs also in the phloem and in the first 1 or 2 annual rings of wood. Except under certain conditions the fungus seems to be a weak parasite but when these conditions are met it causes serious injury and may even result in the death of the tree.—*W. B. McDougall.*

5826. Girardi, I. **La sarna de las naranjas.** [Citrus scab.] Defensa Agric. [Uruguay] 3: 108. 1922.—Scab, said to be due to *Pleospora esperidearum*, is a serious disease of oranges in Uruguay. Control measures are outlined.—*John A. Stevenson.*

5827. Girola, Carlos D. **Ganoderma sessili Morrill.** [sic] Bol. Ministerio Agric. Nacion [Argentina] 27: 236–239. *2 pl.* 1922.—*Ganoderma sessile* Murr. has been prevalent in some parts of Argentina as a cause of root rot of *Prunus armeniaca, P. domestica, Pyrus, Ficus carica, Punica granatum, Robinia, Gourliea decorticans, Casuarina, Eucalyptus* sp., and other forest trees. Control measures are outlined.—*John A. Stevenson.*

5828. Goldsworthy, Marion C. **Peach leaf curl.** Associated Grower 5^3: 6. 1923.

5829. Gonzalez, Manrique R. **El añublo o tizon del trigo, la avena y la cebada.** [The smuts of wheat, oats and barley.] Rev. Agric. [Mexico] 7: 307–313. *8 fig.* 1922.—The smuts attacking wheat, oats, and barley in Mexico are discussed and control measures outlined.—*John A. Stevenson.*

5830. Gram, E. **Om Kartoffelbrok og Foranstaltninger mod denne i vore Nabolande.** [Potato wart and control measures in adjacent states.] Ugeskrift Landm. 68: 32–33. 1923.—This is a review of the situation in Germany where *Synchytrium endobioticum* is spreading, in England where it is common in certain regions, in Holland and Norway where it is limited, and in Sweden where in 1912 it was exterminated in 2 localities.—*Ernst Gram.*

5831. Heald, F. D., G. L. Zundel, and L. W. Boyle. **The dusting of wheat and oats for smut.** Phytopathology 13: 169–183. *Fig 1.* 1923.—A report of 2-years' results on dust treatment of seed wheat for the prevention of bunt (*Tilletia Tritici*) is given. The dusts used include copper carbonate, Corona Compound of copper carbonate, anhydrous copper sulphate and calcium carbonate, anhydrous copper sulphate and hydrated lime, and Sedosan. Copper carbonate has given the most satisfactory results. With heavily smutted seed sown in spring, 2 ounces of copper carbonate dust per bushel gave perfect protection in 1921. In 1922, 3 ounces per bushel were required for perfect protection. For fall-sown wheat on fallow land the results have not been so satisfactory, though the copper carbonate dust was more effective than formalin and nearly as effective as copper sulphate solution in field trials of fall-sown wheat.—*B. B. Higgins.*

5832. Herrera, A. L. **La gomosis del naranjo.** [Gummosis of the orange.] Agric. Mexicano y Hogar 39: 57–59. 1923.—Gummosis, reported as "probably due to *Fusisporium limonii*," is a serious disease of the orange in Mexico. A gummy exudate appears at the base

of the tree and out along the larger roots. This is followed by a rotting of the bark. The disease is favored by faulty drainage and other unfavorable cultural conditions. The remedying of these conditions and the use of resistant stocks is recommended.—*John A. Stevenson.*

5833. Kenoyer, L. A. [Rev. of: Jackson, H. S., and E. B. Mains. **Aecial stage of the orange leafrust of wheat, Puccinia triticina Eriks.** Jour. Agric. Res. 22: 151–171. *Pl. 21, fig. 1.* 1921 (see Bot. Absts. 11, Entry 480).] Jour. Indian Bot. 3: 118. 1922.

5834. King, C. J. **Cotton rootrot in Arizona.** Jour. Agric. Res. 23: 525–527. 1923.—*Ozonium omnivorum* fruits abundantly at Sacaton, Arizona. The fungus spreads in a "fairy ring" and the fruiting bodies are found abundantly on moist soil at the margin of the ring. A felt-like mat is formed 15–25 cm. outside the outer circle of recently wilted plants.—Cotton plants were infected by placing diseased roots beside healthy ones and also by inoculation with mycelium from pure culture.—Spores are germinated with difficulty and have not been used successfully as a medium of infection.—Progress of the rings has been stopped by saturating the soil at the periphery of the ring with 1 part commercial (40 per cent) formaldehyde to 100 parts water. In alfalfa fields the zone of disinfection must be about 75 cm. outside the line of wilted plants and in cotton fields 150 cm.—*D. Reddick.*

5835. Kulkarni, G. S. **Smut (Ustilago paradoxa Syd. and Butl.) on sawn (Panicum frumentaceum Roxb.)** Jour. Indian Bot. 3: 10–11. 1922.—This is thought to be the 1st record of this smut from the Bombay Presidency, where it was found in 1919. Infection occurs in the seedling stage, and can be prevented by treating the seed for 10 minutes with 2 per cent copper sulphate solution.—*Winfield Dudgeon.*

5836. Lehman, S. G. **Pod and stem blight of the soybean.** Jour. Elisha Mitchell Sci. Soc. 38: 13. 1922.—The causal agent is an Ascomycete and is given the name *Phomopsis Sojae.* It attacks pods, stems, and less often leaves; and seed in diseased pods are frequently invested by a conspicuous, white, fungus covering. Infected areas become specked with minute, black pycnidia which form spores in a few days. The plant overwinters in diseased stems and seeds.—*W. C. Coker.*

5837. McDonald, A. H. E. **Dry treatment of seed wheat for bunt.** Agric. Gaz. New South Wales 34: 239–241. *1 fig.* 1923.—The machine designed by the Washington Experiment Station for treating with copper carbonate is figured and discussed.—*L. R. Waldron.*

5838. Miyake, Koji, und Masashi Adachi. **Chemische Untersuchungen über die Widerstandsfähigkeit der Reisarten gegen die "Imochi-Krankheit." Erster Bericht. Vergleich der hauptsächlichsten chemischen Bestandteile von vorläufig zwei in Hokkaido angebauten Reisarten, einer empfänglichen und einer widerstandsfähigen. [Chemical studies of varietal resistance of rice to the rice blast fungus. First paper. Comparison of the chief chemical constituents of a susceptible and a resistant variety cultivated in Hokkaido.]** Jour. Biochem. Tokyo 1: 223–239. 1922.—Two varieties of rice, "Akage," which is susceptible to rice blast, and "Bozu," which is resistant, were used. The plants were analyzed at 3 stages of development, (1) appearance of the spikes, (2) beginning of bloom, and (3) when the seed were in milk, analyses being made upon both expressed juice and entire plants. For the studies on expressed juice, the heads were removed and discarded, the leaves and stalks were ground and pressed, and the expressed juice centrifuged to remove starch. The susceptible Akage was lower in total solids in the 1st period and higher in the 2nd and 3rd, than Bozu. It was lower in protein in the 1st and 2nd periods, but higher in the 3rd period; higher in total nitrogen in all 3 periods; higher in protein nitrogen in the 1st and 3rd periods but lower in the 2nd period; higher in non-protein nitrogen in the 1st and 2nd, but lower in the 3rd. Reducing sugars were higher in Akage in the 1st and 3rd periods, lower in the 2nd; while non-reducing sugars were higher in all 3 periods, especially so in the 1st and 3rd. The analyses of entire plants exclusive of heads, showed that Akage was higher in total solids, nitrogen-free

extract, and non-reducing sugars; but lower in crude fiber and ash at all 3 periods of development. Protein and total nitrogenous materials were higher in Akage in the 1st and 2nd periods, and lower in the 3rd; but protein nitrogen was lower in the 1st period, and higher in the 2nd and 3rd, while non-protein nitrogen was higher in the 1st and lower in the 2nd and 3rd. Fat content was identical in the 2 varieties in the 1st and 2nd periods, but lower in Akage in the 3rd. Reducing sugars were lower in Akage in the 1st period, but practically double in the 2nd and 3rd. The distribution of organic and inorganic materials between nodes and internodes in the 3rd period was also studied, the nodes being richer in organic materials than the internodes, and the absolute amounts higher in Akage than in Bozu. Comparative studies of the leaves of the 2 varieties in the 2nd period showed rather small differences, Akage being slightly higher in nitrogenous constituents and reducing sugars, magnesia and phosphoric acid, than Bozu. Ash analyses of entire plants at all 3 periods of growth showed that Bozu is slightly higher in total ash, materially higher in silica and calcium, slightly higher in sodium and sulphur, and lower in potassium and phosphoric acid, throughout the development. The suggestion is made that the higher inorganic content of Bozu, especially in silica, may serve as a mechanical protection against infection by the fungus. [See also following entry.]—*Joseph S. Caldwell.*

5839. Miyake, Koji, und Masashi Adachi. **Chemische Untersuchungen über die Widerstandsfähigkeit der Reisarten gegen die "Imochi-Krankheit." Zweiter Bericht. Der Einflusz der Wasserstoffionenkonzentration auf das Wachstum des Pilzes. [Chemical studies of the varietal resistance of rice to the rice blast fungus. Second paper. The influence of H-ion concentration upon the growth of the fungus.]** Jour. Biochem. Tokyo 1: 241–247. 1922.—Cultures of the "Imochi"-fungus [*Dactylaria parasitans* Cavara] were grown upon a synthetic medium composed of 1 gm. asparagin, 1 gm. NH_4NO_3, 0.5 gm. acid potassium phosphate, 0.25 gm. $MgSO_4$, and 20 gm. cane sugar in 1 l. H_2O. Four series of 100 cc. flasks of this solution were prepared and inoculated. One series of 11 flasks received 1–10 cc. $\frac{N}{100}$ HCl, while the others received like quantities of H_2SO_4, tartaric, and citric acids of like concentration. The range of pH in the series was 6.1–2.6. The fungus made no growth in 10 days at pH 2.6–3.3, very slight at pH 3.3–4.2, fairly good at pH 4.4–5.8, and excellent growth at pH 5.9–6.1. The pH of the medium is altered by the growth of the fungus in direct proportion to the vigor of the growth; solutions which originally had a pH of 6.1 had increased in acidity to pH 5.7–4.9 at the end of 10 days. A similar but smaller shift occurs throughout the series wherever growth occurs. The authors state that in their earlier work (see preceding entry) they found very slight differences in the H-ion concentration of the juice of Akage (susceptible) and Bozu (resistant) rice, but do not present the data, promising further work on the subject.—*Joseph S. Caldwell.*

5840. Phillips, Edith H. **Checking fig smut.** Associated Grower 5^2: 20–22. 1923.—Fig smut, *Aspergillus niger*, is carried by the dried fruit beetle, *Carpophilus* Linn., and the vinegar fly, *Drosophila ampelophila* Weigen. The author recommends removing, burning, or plowing under all waste fruit to destroy the breeding places of the beetle.—*E. L. Overholser.*

5841. Potter, M. C. **Wart disease of the potato. Preliminary experiments.** Trans. British Mycol. Soc. 8: 247–249. 1923.—The experiments, briefly described, indicate that high soil alkalinity prevents the disease, due to *Synchytrium endobioticum*, but that it also has a tendency to reduce the crop. More extensive experiments on the relation of the wart disease to both alkalinity and acidity are planned for the coming year.—*W. B. McDougall.*

5842. Scott, C. Emlen. **Disease of chestnut trees new to California.** Monthly Bull. California Dept. Agric. 11: 740–741. 1922.—A disease caused by a species of *Fusicoccum* closely related to *Endothia parasitica* (Murr.) Anders., which causes the chestnut blight, has appeared in Grass Valley, California. The *Fusicoccum* sp. enters the bark through wounds forming a canker which spreads lengthwise and around the branch and finally girdles it,

killing all parts beyond the canker. The disease is probably less virulent than that caused by *Endothia parasitica*. The recommendations for control are to remove all affected parts and thoroughly disinfect pruning wounds.—*E. L. Overholser.*

5843. Sharples, A. **Final report on treatment of mouldy rot disease with Agrisol.** Malayan Agric. Jour. **11**: 36–37. 1923.—The treatment earlier reported (see Bot. Absts. 12, Entry 1262) has been continued satisfactorily for a further period of 18 months. In the writer's opinion complete eradication is impossible owing to the periodic production of resting spores of *Sphaeronema fimbriatum*, but effective control at small cost is possible.—*R. E. Holttum.*

5844. Smith, E. H., and E. H. Phillips. **Studies of the so-called "smut" of white fig varieties.** Monthly Bull. California Dept. Agric. **11**: 755–758. *Fig. 178–180.* 1922.—Smut, caused by *Aspergillus niger* (*Sterigmatocystis*), occurs on all white figs, but especially on Adriatics. Natural infections occur in ripe figs ready to pick for fresh shipment, although artificial innoculations are successful even in hard green fruit. Ants, fruitflies, and beetles are the chief spore carriers.—*E. L. Overholser.*

5845. Snell, Walter H. **The effect of heat upon wood destroying fungi in mills.** Proc. Amer. Wood Preservers' Assoc. **18**: 25–32. 1922.—This paper is a preliminary report of experiments to determine the thermal death points of the mycelia of 5 mill fungi within wood, using both moist and dry heat. The five fungi were: *Lenzites sepiaria, L. trabea, Trametes serialis, T. carnea,* and *Lentinus lepideus.* None of the fungi could withstand 131°F. for 12 hours, while it took 221°F. for 12 hours to kill all the fungi with dry heat. At 212°F. 1 fungus survived 12 hours and another 24 hours in dry heat. It is concluded that the use of heat in buildings for killing these fungi is of no use, although it is recommended as a deterrent or preliminary preventive. It is pointed out from the curves that kiln drying, as well as the heat developed in certain wood-preservation processes, should kill all of these fungi.—*Walter H. Snell.*

5846. Spieckermann, A. **Wie kann die weitere Verbreitung des Kartoffelkrebses in Deutschland verhindert werden? [How can the further spread of the potato wart disease in Germany be prevented?]** Illus. Landw. Zeitg. **42**: 371–372. 1922.—It is recommended that resistant varieties, clean seed, and quarantine methods be employed to prevent the spread of the potato wart disease caused by *Chrysophlyctis endobiotica.—John W. Roberts.*

5847. Stanford, H. R. **Control of peach scab.** Monthly Bull. California Dept. Agric. **11**: 765–774. *Fig. 181–185.* 1922.—Peach scab, caused by *Cladosporium carpophilum* Thüm., has been increasing in severity in California. The Lovell variety is most affected; Ontario, Elberta, Muir, and Phillips Cling have been damaged somewhat. Scab caused at least 15 per cent of the peaches in a sample of Lovells to go into inferior grades. If the fruit is canned rather green, many smaller scab spots come off in the lye solution.—The author gives the life history of the fungus.—Two sprays of self-boiled lime-sulphur applied during the period from 1 month after blooming to 6 weeks before ripening gave satisfactory results.—*E. L. Overholser.*

5848. Tisdale, W. H., J. W. Taylor, and Marion A. Griffiths. **Experiments with hot water, formaldehyde, copper carbonate, and chlorophol for the control of barley smuts.** Phytopathology **13**: 153–160. 1923.—Experiments on the control of loose smut (*Ustilago nuda* (Jens.) Kell. and Schw.) and covered smut (*U. Hordei* (Pers.) Kell. and Schw.) of barley were conducted through a period of 3 years. Various seed disinfectants were tried, but special attention was given the modified hot-water treatment and the formaldehyde treatment. Both treatments were effective in reducing the amount of infection by either fungus. Formaldehyde was more effective in the control of loose smut than in the control of covered smut, was only slightly less effective than the modified hot-water treatment, and was much more

easily applied. Both treatments injured germination to some extent; and little or no increase in yield resulted from the treatments. There was considerable variation in the reaction of the different varieties to the treatments used.—*B. B. Higgins.*

5849. Weir, James R. **The genus Polystictus and decay of living trees.** Phytopathology **13:** 184–186. 1923.—Several collections of species of *Polystictus* growing on wood of living forest trees are reported. In every case the fungi were growing on injured portions of the tree, and in most cases no extensive decay was produced. The opinion is expressed that fungi of this genus may generally be ignored in forest management.—*B. B. Higgins.*

DISEASES CAUSED BY BACTERIA

5850. Anonymous. **Instrucciones para extirpar la gomosis de la caña de azúcar. [Instructions for eradicating gummosis of sugar cane.]** Rev. Agric. Puerto Rico 6^6: 23. 1921.—The author recommends the use of disease-free seed of resistant varieties and the destruction of diseased stools.—*John A. Stevenson.*

5851. Levin, Isaac, and Michael Levine. **The action of buried tubes of radium emanation on neoplasias in plants.** Jour. Cancer Res. **7:** 163–170. *1 pl.* 1922.—In normal adult plant tissue the only perceptible result of the insertion of a radium-emanation tube is a complete destruction of tissue in the immediate vicinity. A similar insertion into crown-gall tissue is followed by inhibition of development of the neoplasia, thus indicating an inhibition of the nuclear proliferating activity. The cellulose cushion seems to play a role in plants in walling off the necrotic area about the radium-emanation tubes and in filtering off the soft beta rays similar to the role played by connective tissue stroma in animal tumors.—*Frederick V. Rand.*

5852. Levin, Isaac, and Michael Levine. **The rôle of neoplasia in parasitic diseases of plants.** Jour. Cancer Res. **7:** 171–178. *1 pl.* 1922.—Neoplasia in parasitic diseases of plants is, according to the authors, unlike neoplasia in animal cancer since it always represents a protective reaction of the plant organism against the invasion of a parasite. Plant neoplasias behave more like reactive neoplasia in an animal than like animal cancer. Neoplastic tissue in plants is constructed of only 1 type of cells and presents therefore an ideal material for the study of tumor formation. The study of plant neoplasias should become an integral part of all phases of cancer research, whether aiming at the elucidation of the etiology or pathogenesis of the disease or of the correct basis for therapy.—*Frederick V. Rand.*

5853. Matz, Julius. **La enfermedad de la gomosis de la caña de azúcar. [Gummosis of sugar cane.]** Rev. Agric. Puerto Rico 9^3: 11–14. *2 fig.* 1922.—The history of the gumming disease (*Bacterium vascularum* (Cobb) G. Smith) in Porto Rico is reviewed with brief mention of symptoms and control measures. Among resistant varieties are D109, D433, D625, D117, Uba, B208, Yellow Caledonia, B3412, B6292, B1809, P.R. 333, P.R. 334, and P.R. 292.—*John A. Stevenson.*

5854. Matz, Julius. **Observaciones en la gomosis de la caña en Puerto Rico. [Observations on gummosis of cane in Porto Rico.]** Rev. Agric. Puerto Rico 6^4: 33–39. *2 fig.* 1921.—The gummosis (*Bacterium vascularum*) of sugar cane was first discovered in Porto Rico in Feb., 1920, at which time field inspections indicated that the disease was limited to a comparatively small area around Rio Piedras on the North coast. Within a year it had spread over a much wider area. In addition to the usual symptom reported, namely, the exudation of a gummy substance when infected canes are cut, others have been noted. Characteristic markings appear on the leaves, either as gray stripes or short linear spots. There is a tendency toward incomplete unfolding of the center leaves. Infected plants are stunted and commonly develop top rot. The vascular bundles are stained red.—Diseased stools should be dug and only disease-free seed used in replanting. The native white variety (Otahiti) is

very susceptible to the disease, Cristalina and Rayada are more resistant, while Yellow Caledonia and D109 are very resistant. Planting tests with a number of varieties seem to indicate that the disease is not transmitted through the soil.—*John A. Stevenson.*

5855. Matz, Julius. **Observaciones sobre la gomosis de la caña en Puerto Rico. [Observations on the gummosis of sugar cane in Porto Rico.]** Rev. Agric. Puerto Rico 8^1: 5–14. *2 fig.* 1922.—Within a year after its discovery [see preceding entry], gumming disease (*Bacterium vascularum*) of sugar cane had spread at least 25 km. During 1922 the disease spread over much of the Island. Symptoms are again given [see preceding entry]. Several varieties of cane grew normally in soil from which diseased plants had been removed. Cane varieties varied greatly in resistance: White or Otahiti, Rayada, Cristalina, B376, P.R. 358, and P.R. 491 proved very susceptible; Kavangire, Yellow Caledonia, and a number of Porto Rican seedlings were very resistant, if not immune; other varieties showed greatly varying degrees of resistance between these 2 groups. The importance of using disease-free seed for planting is emphasized.—*John A. Stevenson.*

5856. Milbrath, D. G. **Résumé of pear blight history and methods of control.** Monthly Bull. California Dept. Agric. 11: 760–765. 1922.—Pear blight, *Bacillus amylovorus* (Burr.) Trev., occurred in all states where apples and pears were grown in 1922, and was serious in California, Vermont, New Jersey, Michigan, Montana, and Arizona. Descriptions of the symptoms and method of infection are given. Use of resistant or immune root-stocks and trunks, and cutting out of blight cankers are the chief methods of control. Cutting starts in the fall, and should be carefully done. All tools should be disinfected. The solution recommended is mercuric cyanide and bichloride of mercury, 1 ounce of each in 4 gallons of water.—*E. L. Overholser.*

5857. Smith, Erwin F. **Appositional growth in crown-gall tumors and in cancers.** Jour. Cancer Res. 7: 1–105. *28 pl.* 1922.—The views of various medical investigators relative to appositional growth in cancers are reviewed, and the following data relative to crown gall are presented by the author: (1) The absence of any capsule, and the conversion of cortex-cells into tumor-tissue by contact (growth by apposition), something easily to be understood in this tumor because it is due to an intracellular schizomycete, and the adjacent cellulose walls of the cortex-cells, ray-cells, and pith-cells are numerously pitted and are fundamentally all 1 type of tissue; (2) the frequent limitation of the appositional growth through the crushing of remoter cells of the cortex; (3) the limitation of peripheral growth on one side or lobe of a tumor for no apparent reason while it continues on the other side or lobes; (4) the penetration of the tumor by way of the medullary ray across the phloem, cambium and the woody cylinders, which are split apart; (5) the formation in some cases of independent small tumors (pseudometastases) in the pith near the primary tumor although the inoculations were restricted to the cortex; (6) the downward invasion of a medullary ray (beginning of a tumor-strand) in the wood; (7) the small size and immaturity of the tumor-cells in comparison with the size and age of the mother-cells and their great affinity for tumor-stains; (8) the enormous multiplication of cells considering that the tumors were produced by single infected needle-pricks and that the whole period of growth was only 3 weeks; (9) the absence of any intercellular spaces in the tumor tissue or in the rapidly dividing transition tissue; (10) the distinct enlargement of the cortex-cells before their conversion into tumor-cells, which leads to a thickening of the cortex around the tumor, a sort of cushion being formed of which the tumor is the center; (11) the tendency of the nuclei in the transition tissue to be large and to be variously notched, cleft, lobed, or mulberry-shaped and the occasional occurrence of 2–4 nuclei in the cell; (12) the big border around the nucleoli, perhaps only an indication of rapid growth; (13) numerous faint-staining abnormal granules in the cytoplasm of the transition tissue and of the tumor tissue as seen under high powers; (14) the fact that in young plants (those less than half grown) almost any cortex-cell is capable of further and repeated division, especially under a tumor-stimulus, whereas results on old tissues tend to confirm Bard's view that the reproductive capacity of old cells is zero; (15) development of roots under and near

the tumors as a result of the tumor stimulus; (16) experimental disproof of Ribbert's dictum that parasites cannot change the form of cells or cause them to proliferate. Schmieden's words respecting his studies of liver tumors describe the hypertrophy on the margin of these crown galls exactly: "aus diesen Riesenzellen wächst unmittelbar eine Brut hervor, die keine Leber [Cortex]-zellen mehr sind, sondern Zellen des Tumors."—*Frederick V. Rand.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

5858. Ballard, E. **Platyedra gossypiella Saund., the pink boll-worm in South India, 1920–1921.** Mem. Dept. Agric. India Entomol. Ser. 7: 171–193. *Pl. 16–18.* 1923.—Since 1 boll-worm (*Platyedra*) eats only 2 or 3 seed the damage might be assumed to affect only 1 locule, but in addition to this the lint is often stained, fungus spores enter through the escape-hole of the larva, and threads of lint are often stuck together. Unattacked seed in an attacked boll are also affected.—Larvae of *Earias* spp. wander from boll to boll, destroy buds and young bolls, and by the holes which they make in grown bolls provide an entrance for fungi and bacteria.—Details of actual losses from these insects are given.—*Frederick V. Rand.*

5859. Corbett, G. H. **Preliminary note on the two coloured coconut leaf beetle (Plesispa Reichei Chap.).** Malayan Agric. Jour. 11: 64–69. 1923.—This insect was formerly little known but is now generally distributed throughout Malaya. It attacks many palms, eating the young leaves before they unfold. Both larval and adult stages feed upon the upper and lower surfaces of coconut palm leaves, eating in straight lines without interruption. Later these lines unite with each other so that the remaining tissue dries and rots, the leaf tears, and the young plants take on a peculiar weather-beaten appearance and their growth is seriously retarded. It is especially a pest of seedlings and young plants but usually causes little permanent injury to older plants. It can be effectively dealt with by means of a solution of lead arsenate.—*R. E. Holttum.*

5860. Cory, Ernest N. **Experiments on the control of the woolly aphis.** Maryland Agric. Exp. Sta. Bull. 252. *25–36.* 1923.—Two applications per year of an 8 per cent solution of pine-tar oils seem to offer the best promise for control, with a minimum of injury to the apple trees. Injury is likely to result from 15–20 per cent solutions, and repetition of the 2 applications at the 8 per cent strength for 3 seasons caused considerable injury.—*Frederick V. Rand.*

5861. Kinsey, Alfred C. **Studies of some new and described Cynipidae (Hymenoptera).** Indiana Univ. Studies 9: 1–141. 1922.—This paper gives descriptions of a large number of gall wasps and the galls which they incite, and offers some data on the variation, distribution, life histories and phylogeny of these insects.—*Frederick V. Rand.*

5862. Kinsey, Alfred C., and Kenneth D. Ayres. **Varieties of a rose gall wasp (Cynipidae, Hymenoptera).** Indiana Univ. Studies 9: 142–162. 1922.—This is a study of the varieties of *Diplolepis tuberculatrix* Cockerell and includes descriptions both of the insects and the plant galls induced by them.—*Frederick V. Rand.*

5863. McWhorter, Frank P. **The nature of the organism found in the Fiji galls of sugar cane.** Louisiana Planter 70: 148–150. *Fig. 1–2.* 1923.—Reproduced from The Philippine Agriculturist [see Bot. Absts. 12, Entry 2644].—*C. W. Edgerton.*

5864. Nüsslin, Otto. **Forstinsektenkunde.** [Forest insects.] 3rd ed., edited by L. Rhumbler. *xvi + 568 p., 457 fig.* Paul Parey: Berlin, 1922.—The 1st part of the work is a general treatise dealing with the morphology, biology, and physiology of insects. In addition, insects injurious and beneficial to forests are briefly discussed.—In the 2nd part insects are treated in systematic order, detailed descriptions being given as well as host reactions.—*Lillian C. Cash.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOW GROUPS, ETC.)

5865. Anonymous. **Virus diseases of plants.** Nature 111: 551. 1923.—This is a brief popular review of the virus disease situation with special reference to a review by E. J. Butler in Science Progress for Jan., 1923.—*O. A. Stevens.*

5866. Chardón, Carlos E. **Resumen de la literatura sobre el origen de las enfermedades del "mosaico" en las plantas.** [Résumé of the literature on mosaic diseases of plants.] Rev. Agric. Puerto Rico 9^4: 13–22. 1922.—The literature dealing with mosaic diseases of tobacco, sugar cane, and other crops is reviewed and the various theories as to the causative agents, such as bacterial, physiological, filterable virus, etc., are discussed. A bibliography is appended.—*John A. Stevenson.*

5867. Chardón, Carlos E., y Rafael A. Veve. **Sobre la trasmisión del matizado de la caña por medio de insectos.** [Transmission of cane mosaic by insects.] Rev. Agric. Puerto Rico 9^2: 9–20. *2 fig.* 1922.—A number of workers in Porto Rico and Cuba have investigated the possibility of insects acting as carriers of the mosaic disease of sugar cane, but for the most part with negative results. Brandes, working in Washington, demonstrated that *Aphis maydis* can transmit the disease from diseased to healthy cane. Observations of the authors demonstrated that this insect is of common occurrence on malojillo (*Panicum barbinode*) and other grasses growing as weeds in cane fields and that when the weeds are cut the insects pass over to the cane for a short time, with the result that mosaic appears on previously healthy plants in about 3 weeks. This period of incubation corresponds with that established by Brandes. In order to check up the field observations, large insect-proof cages were placed over stools of the cane variety D1111 and weed grasses allowed to grow. A supply of *Aphis maydis* was placed in one cage and another left as a check. Mosaic appeared on 64 per cent of the cane plants following the cutting of the grass. Plants in the check cage remained free from disease. Similar experiments with a new species of leaf hopper (*Carolinia*) which lives on *Cyperus rotundus* likewise gave positive results.—*John A. Stevenson.*

5868. Chardón, C. E., and R. A. Veve. **The transmission of cane mosaic.** Facts about Sugar **15**: 281, 283–284. 1922.—[See preceding entry.]

5869. Chardón, Carlos E., and R. A. Veve. **Transmission of cane mottling disease through insects.** Louisiana Planter **69**: 323–325. *Fig. 1–2.* 1922.—Translated from Rev. Agric. Puerto Rico [see 2nd preceding entry].

5870. Coleman, Leslie C. **Transmission of sandal spike.** Indian Forest. **49**: 6–9. *Pl. 1–3.* 1923.—A number of sandal seedlings (*Santalum album*) were planted in small groups, and after 5-years' development of the trees, spike was introduced into the group by grafting a diseased branch to one member of the group. In 2 months the disease had been communicated to the other trees in the group and upon removing the soil haustorial unions were discovered. In 2 cases the haustoria belonged to the originally healthy tree and were attached to the infected tree by natural grafting. Apparently the infective virus or organism was transmitted freely through the roots.—*E. N. Munns.*

5871. Colon, E. D. **Trabajos de investigación durante el año fiscal de 1919–20.** [Investigational work during the fiscal year 1919–20.] Rev. Agric. Puerto Rico 6^3: 7–14. 1921.—The mosaic disease of sugar cane was attacked from various angles, all divisions of the experiment station giving it attention. Experiments in the transmission of the disease were carried out by the entomologist, varietal resistance tests by the agronomist, and etiology studies by the pathologist. The latter work is said to have demonstrated the presence of certain bodies in the cells of diseased plants which may be those of a causative organism. Other cane diseases, including root disease, were also studied.—*John A. Stevenson.*

5872. Gram, Ernst. **Kan vi kontrollere os fra Bladrullesygen?** [Can potato leaf-roll be controlled by inspection?] Vort Landbrug [Copenhagen] 41: 416–417. 1922.—With the heavy attacks of leaf-roll and mosaic in Denmark during 1922 in mind it is urged to utilize localities which act as "sanatoria," together with the Dutch methods of rigid inspection and control of the progeny.—*Ernst Gram.*

5873. Lugo, F. Oliver. **El mosaico del tabaco y como combatirlo.** [Tobacco mosaic and its control.] Rev. Agric. Puerto Rico 10[1]: 11–14. 1923.—The author believes that the infectious principle of mosaic disease of tobacco persists in the soil from one season to another and therefore recommends a 3-year rotation in addition to the destruction of diseased plants. Such a rotation would include tobacco, a leguminous green manure crop, and a food crop such as corn, yautía, or sweet potatoes.—*John A. Stevenson.*

5874. Matz, Julius. **Recientes investigaciones en el estudio de la naturaleza del mosaico de la caña de azúcar y otras plantas.** [Recent investigations into the nature of mosaic of sugar cane and other plants.] Rev. Agric. Puerto Rico 9[4]: 9–12. 1922.—The mosaic diseases have been studied for many years in an attempt to ascertain the cause, but not until recently has definite progress been made. Workers with tobacco and sugar cane mosaic in Java and Hawaii, and the author in Porto Rico, have demonstrated the presence of plasmodium-like bodies in the cells of diseased plants. The exact nature of these bodies is as yet unknown. Those found in diseased sugar cane plants are considered by the author co-generic with *Strongyloplasma Iwanowskii* Palm, the name assigned to the bodies found by Palm associated with the mosaic disease of tobacco.—*John A. Stevenson.*

NON-PARASITIC DISEASES

5875. Bartholomew, E. T., J. T. Barrett, and H. S. Fawcett. **Internal decline of lemons I. Distribution and characteristics.** Amer. Jour. Bot. 10: 67–70. *Pl. 7.* 1923.—The term "internal decline" is applied to a physiological abnormality causing the destruction of internal tissues in the lemon fruit, usually in the stylar end. It may appear almost anywhere throughout southern California, except among groves situated a few miles from the coast. All varieties may be affected. It usually begins in June, continues until November or December, and is found on trees of all ages. The various external and internal symptoms of internal decline are described as they affect fruits at the different degrees of maturity,—"dark green," "light green," "silver," and "tree-ripe."—*E. W. Sinnott.*

DISEASES OF UNKNOWN CAUSE

5876. Sharples, A., and L. Lambourne. **Preliminary report on brown bast experiments in Malaya.** Malayan Agric. Jour. 11: 30–35. 1923.—Results of experiments on 410 rubber [*Hevea*] trees (divided into plots of about 50 each) subjected to 3-months' preliminary heavy tapping are recorded. As regards periods of development of Brown Bast and of quiescence no definite correlation with external conditions has been observed. In 40 out of 133 trees which developed Brown Bast there was no downward extension of the affection after tapping had ceased; in the other trees it extended downward, stopping either at the limit of virgin bark, at the junction between renewed bark of 2 and 4–6 years' growth, or at the base of the tree. In 1 plot which showed an abnormally long quiescent period the final sudden increase of Brown Bast was correlated with a sudden increase in average tree yield. The conclusion is drawn that Brown Bast is closely associated with the question of high yields and that it almost certainly acts as a limiting factor in the question of high-yielding trees. Brown Bast affection is to be considered as an exhaustion process, and if excessive yielding results in exhaustion high yielders will tend to show this effect sooner than average yielders. The question is thus of primary importance in consideration of possible results of bud-grafting practiced to obtain higher yields. The authors further point out the possibility that high-yielding bud-grafts may show accelerated vital activities and as a result may be susceptible

to diseases not affecting normal trees. The margin of safety is small and too optimistic views have been taken as to the possibilities of bud-grafting.—The phenomenon of phloem necrosis may occur independently of the production of Brown Bast.—*R. E. Holttum.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE.

5877. Anonymous. **Pathology of market produce.** Nature **111**: 516. 1923.—In the U. S. A. a new field of scientific investigation has been opened up between crop and consumer. This new field of market pathology is typified in recent studies by Link and Gardner, and by N. E. Stevens.—*Frederick V. Rand.*

5878. Anonymous. **Structure and origin of the plant gall.** [Rev. of: Cook, Melville T. **The origin and structure of plant galls.** Science **57**: 6–14. 1923 (see Bot. Absts. 12, Entry 3452).] Nature **111**: 483. 1923.—"Prof. Melville T. Cook has rendered a service to workers in a field where the literature is very widely scattered."—*Frederick V. Rand.*

5879. Anonymous. [Rev. of: Palmer, Ray, and W. Percival Westell. **Pests of the garden and orchard, farm and forest.** *413 p., 47 pl. (3 col.)* Henry J. Drane: London, 1922.] Nature **111**: 530–531. 1923.—"The authors have aimed at meeting the needs of practical agriculturists and horticulturists by collecting into one book all the available information on plant pests and diseases necessary for their guidance."—*Frederick V. Rand.*

5880. Allen, W. J., and W. LeGay Brereton. **Further experiments with a spray gun.** Agric. Gaz. New South Wales **34**: 354–356. 1923.—Using a varying pressure of 250–290 pounds with an orifice of 0.114 inches the spray gun used 4.9 gallons of spray per tree, whereas 3.8 gallons per tree were used with double nozzles and 2 leads of hose. The latter method requires less spray per tree but takes more time. Decreasing the orifice in the spray gun decreased the amount of spray used. With a coarse jet a height of 36 feet was attained. The spray gun is considered a valuable addition to spray appliances but further tests are necessary in order to measure the value of the device.—*L. R. Waldron.*

5881. Anderson, P. J., and A. V. Osmun. **An improved formaldehyde tank for the onion drill.** Phytopathology **13**: 161–168. *Fig. 1–3.* 1923.—It was found that the tanks usually recommended and used on onion seed drills would not deliver the liquid at a constant rate, the rate varying with the amount of liquid in the tank and with the speed of the drill. An attachment has been devised, and is here described, which eliminates the variation due to the weight of the liquid. The rate of delivery of the solution varies only with the speed of the drill.—*B. B. Higgins.*

5882. Brierley, William B. [Discussion of: Lang, Wm. H. **Some aspects of vegetable pathology in relation to human disease.**] British Med. Jour. 1922. 962–963. 1922.—There is an unbridgeable gulf between the morphology, anatomy, and physiology of animals and plants. There is, therefore, little that can be helpful and much possibility of confusion in making detailed comparisons of host tissue responses in plant and animal diseases. There is, however, a vast field for common study of the great groups of microorganisms; and the utmost of value can be obtained from an intimate exchange of facts and points of view.—*Frederick V. Rand.*

5883. Butler, E. J **Diseases of plants in England in 1920–21.** [Rev. of: Cotton, A. D. **Report on the occurrence of fungous, bacterial and allied diseases on crops in England and Wales for the years 1920–21.** Ministry Agric. and Fisheries Misc. Publ. 38. *104 p.* 1922. (see Bot. Absts. 12, Entry 5886).] Nature **111**: 416–417. 1923.

5884. Call, A. H. **Vacuum fumigation of nursery stock in Ventura County.** Monthly Bull. California Dept. Agric. **11**: 467–468. 1922.

5885. Compere, Geo. **Origin of fumigation with hydrocyanic-acid gas in California.** Monthly Bull. California Dept. Agric. **11**: 438–442. *Fig. 161–162.* 1922.—The author gives a brief history of the discovery and introduction of hydrocyanic-acid gas as a means of fumigating citrus trees in California.—*E. L. Overholser.*

5886. Cotton, A. D. **Report on the occurrence of fungous, bacterial and allied diseases on crops in England and Wales for the years 1920–1921.** Ministry Agric. and Fisheries Misc. Publ. 38. *104 p.* 1922.—This report comprises data as to prevalence, distribution, varietal reactions, etc., relative to diseases of cereals, potatoes, root crops, legumes, forage crops, vegetables, fruit, and miscellaneous crops. Weather charts and a special index to diseases are added. [See also Bot. Absts. 12, Entry 5883.]—*Frederick V. Rand.*

5887. Escobar, Rómulo. **Enfermedades criptogámicas de la alfalfa.** [Cryptogamic diseases of alfalfa.] Agric. Mexicano y Hogar **38**: 254–258. 1922.—This is a popular account of the diseases of alfalfa found in Mexico and those that might be introduced there.—*John A. Stevenson.*

5888. Ferdinandsen, C. **Det plantepatologiske Arbejde i Danmark.** [Phytopathological work in Denmark.] Nordisk Jordbrugsforskning **1922**: 333–351. *2 fig.* 1922.—Two lectures at the agricultural college in Berlin are printed. A German abstract appears in Der Deutsche Pflanzchenschutzdienst **2**: 60–62. 1922.—*Ernst Gram.*

5889. Gram, E. **Iagttagelser fra Holland.** [Observations from Holland.] Ugeskr. Landmaend **67**: 427–429. 1922.—This is a report on Dutch work with plant diseases, particularly those of potatoes.—*Ernst Gram.*

5890. Haupt, L. O. **Spring spraying of peaches.** Associated Grower 5^2: 5, 18. *1 fig.* 1923.—The author briefly describes the control of peach blight, peach leaf curl, peach twig borer, San Jose scale, black peach aphis, and red spider under California conditions.—*E. L. Overholser.*

5891. Lopéz, Bernardo. **Algunas enfermedades del tomate en Puerto Rico.** [Some Porto Rican tomato diseases.] Rev. Agric. Puerto Rico 9^6: 33–37. *2 fig.* 1922.—The author discusses the diseases due to *Cladosporium fulvum* Cke., *Fusarium Lycopersici* Sacc., and *Bacillus Solanacearum* E. F. Sm. which make tomato culture difficult in Porto Rico.—*John A. Stevenson.*

5892. Luciano, José. **El servicio de inspección y cuarentena de plantas y la introducción de plantas a Puerto Rico.** [The quarantine and inspection service of Porto Rico and the introduction of plants.] Rev. Agric. Puerto Rico 9^4: 37–41. 1922.—The entry of living plant material into Porto Rico is regulated by Insular quarantine law No. 17 and the various Federal quarantines, more particularly No. 37. These quarantines are administered by the Insular quarantine service in order to prevent further introductions of insect pests and plant diseases from which the Island is now suffering so severely.—*John A. Stevenson.*

5893. McRae, W. **Report of the Imperial Mycologist.** Sci. Rept. Agric. Res. Inst. Pusa, **1921–22**: 44–50. 1922.—*Piricularia Oryzae* Br. et Cav., a destructive disease on *Oryza sativa*, has been found in several localities in India. Similar forms of *Piricularia* are destructive to *Eleusine coracana* and a number of other grasses. Some cross inoculation is possible, but it has not yet been determined whether there are 4 distinct species, or only 4 physiological strains of 1 species. A disease of rice caused by an unidentified sclerotial fungus, and another disease caused by *Cephalosporium* (?) sp. are under investigation.—*Tolyposporium Penicillariae* Bref. on *Pennisetum typhoideum;* downy mildew of maize; Fusarium, Diplodia, and Acrothecium diseases of *Pennisetum typhoideum* and *Zea mays; Helminthosporium* spp. on cereals; *Urocystis coralloides* Rostrup on mustard; smut resistance in sugarcane; and *Macro-*

phoma Corchori Saw. on jute have been studied.—Demonstrations of methods of spraying fruit trees continue.—A fungus and host index of the mycological herbarium at Pusa has been completed.—A program of work for 1922–23 and a list of papers published during the year are included.—*Winfield Dudgeon.*

5894. Matz, Julius. **Informe de la estacion experimental insular. Informe de la división de botánica y patología. Diciembre, 1921.** [Report of the division of botany and pathology.] Rev. Agric. Puerto Rico 8^2: 63–65. 1922.—This is a report of continued investigation of the gumming disease (*Bacterium vascularum*), Plasmodiophora disease, and mosaic of sugar cane as well as of minor diseases of other economic crops.—*John A. Stevenson.*

5895. Milbrath, D. G. **Control of diseases of cucumbers in greenhouses.** Monthly Bull. California Dept. Agric. **11**: 430–437. *Fig. 157–160.* 1922.—The author discusses the common diseases of cucumbers in greenhouses giving their importance, symptoms, methods of infection, and measures for control.—*E. L. Overholser.*

5896. Newell, Wilmon. **The quarantine situation—what is needed.** Florida State Plant Bd. Quart. Bull. **7**: 149–159. 1923.—Opportunities for pests to enter are still numerous and only some of the avenues of entrance have been closed. Dangerous plant material arrives daily at every port of the U. S. A., whether or not quarantine inspectors are stationed at these ports. The Federal Horticultural Board is not affording adequate protection. Out of 35 of the more important maritime and border ports (exclusive of the Canadian line) federal quarantine inspectors are stationed at only 15 and Federal Horticultural Board collaborators (state inspectors) at 10. As to the bulb situation there are indications of a letting up in the policy of increasing protection against foreign pests.—*J. C. Th. Uphof.*

5897. North, D. S. **The control of sugar cane diseases. III.** Australian Sugar Jour. **15**: 73–83. 1923.—An estimate of 9 per cent crop loss at Broadwater has been made. Details for controlling the disease are given. Mosaic and Fiji diseases are being eliminated, but the control of gumming and leaf-scald is proving difficult.—*C. Rumbold.*

5898. Shaw, F. J. F. **Report of the Imperial mycologist.** Sci. Rept. Agric. Res. Inst. Pusa **1920–21**: 34–40. 1921.—Helminthosporium diseases of cereals, especially on *Zea mays* and *Pennisetum typhoideum; Acrothecium lunatum* Wakker on grasses; smut on *Paspalum scrobiculatum L.; Piricularia* on rice [*Oryza sativa*]; diseases of chilli, jute, and areca and palmyra palms have been studied during the year. A host and fungus index of the mycological herbarium at Pusa is projected. Destruction of *Eichornia Crassipes* Solm. (water hyacinth) by spraying with a secret proprietary mixture has been found practicable. A program of work for 1921–22 and a list of publications for the year are given.—*Winfield Dudgeon.*

5899. Strong, Lee A. **The Bureau of Plant Quarantine.** Monthly Bull. California Dept. Agric. **11**: 852–871. *Fig. 207–214.* 1922.

5900. Weber, Anna. **Tomatsygdomme.** [Tomato diseases.] Aarbog for Gartneri **1922**: 81–150. *10 fig.* N. C. Roms Forlag: Copenhagen, 1923.—This is a prize essay from the Danish Gardeners Association containing a key, an account of each disease based on literature studies and original observations, with remarks on control, a summary of general sanitary and control work, and a bibliography and index.—*Ernst Gram.*

5901. Weldon, Geo. P. **Spraying deciduous fruit trees.** Monthly Bull. California Dept. Agric. 11^7: 24–29. 1922.—The author discusses the value of spraying, pointing out that it is an unnecessary operation unless there is a pest actually on the trees. He emphasizes the necessity of knowing the different sprays and fungicides to accomplish successful results, and discusses the pests commonly attacking different deciduous fruit trees in California with control measures for each.—*E. L. Overholser.*

5902. Weldon, Geo. P. **Spring spraying of peaches with lime sulfur.** Monthly Bull. California Dept. Agric. **12**: 44–47. 1923.—Spring spraying with lime-sulphur controls twig borer (*Anarsia lineatella* Zeller) and peach leaf curl (*Exoascus deformans* (Berk.) Fckl). Brown mite (*Bryobia pratensis* Garman), San Jose scale (*Aspidiotus perniciousus* Comstock), and peach blight (*Coryneum Beijerinckii* Oudoem.), are also partially or wholly controlled by the same spray. Dry lime-sulphur is as effective as liquid lime-sulphur. Early spring applications give as satisfactory results as late spring applications.—*E. L. Overholser.*

5903. Weniger, Wanda. **Diseases of grain and forage crops in North Dakota.** North Dakota Agric. Exp. Sta. Bull. 166. *93 p., 32 fig.* 1923.—Information on the occurrence, economic importance, identification, and control of the diseases of cereal and forage crops of the state is brought together. Part I deals with diseases of cereal crops; part II with forage crop diseases; and part III with methods of disease control. Diseases of wheat, oats, barley, rye, flax, corn, proso, and sorghum are described in the order of their importance under their respective hosts. Forage crop diseases are discussed for alfalfa, red and alsike clovers, sweet clover, brome grass, millet, timothy, Sudan grass, the wild grasses of the state, and sunflower. The discussion of specific diseases includes symptoms, cause, importance, and methods of prevention. Methods of seed treatment are given and the problem of disease resistant varieties is discussed. A bibliography of the more important sources of information on specific diseases is included in foot notes.—*Wanda Weniger.*

5904. Young, W. J. **Waterglass. A new wound dressing for trees.** Monthly Bull. Ohio Agric. Exp. Sta. **8**: 13–16. *Fig. 7.* 1923.—The article comprises a brief discussion of the need for a wound dressing for trees and gives a brief report of the use of a solution of sodium silicate as a wound treatment. This preparation has been found very satisfactory in preventing infection from wood-rooting fungi.—*R. C. Thomas.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

H. W. Youngken, *Editor*
E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 5342, 5415, 5649, 5673, 5674, 5943, 6005)

5905. Anonymous. [Rev. of: Greenish, H. G. **The microscopical examination of foods and drugs.** *3d. ed., xx + 386 p.* J. and A. Churchill: London, 1923 (see Bot. Absts. 12, Entry 4446).] Nature 111: 459. 1923.—Additional matter has not been included in this edition on account of the high cost of printing.—*O. A Stevens.*

5906. Aston, B. C. **The poisonous, suspected, and medicinal plants of New Zealand.** New Zealand Jour. Agric. **26**: 230–232. 1923.—Ferns have in some cases been reported as poisonous to stock. Poisoning is likely to occur in stock just turned into pasture containing much fern. Symptoms are described, and it is recommended that any stock showing illness be at once transferred to other pastures.—*N. J. Giddings.*

5907. Bosman, Louis Pierre. **Castelamarin- a bitter principle from Castela Nicholsoni.** Jour. Chem. Soc. [London] **123**: 207–210. 1923.—An investigation of the chemical constitution and properties of castelamarin showed only slight pharmacological activity. However, at a dilution of 1:2000, castelamarin caused a constriction of the coronary vessels of an isolated mammalian heart, the outflow being reduced to ½ or less.—*F. E. Denny.*

5908. Christensen, C. **Exzemplanter. Plants producing eczema.**] Nat. Verden **6**: 259–276. *Fig. 1–8.* 1922.—Dermatitis venenata may occur as a result of continued occupation with *Narcissus* spp. (lily disease of Scilly Islands), and may even become chronic. Under unfortunate circumstances dermatitis may also be caused by otherwise harmless plants, e. g., *Arctium lappa, Angelica, Colchicum, Convallaria, Doronicum,* pumpkin, *Delphinium,*

Humulus, Pastinaca, Euphorbia, Heracleum. Certain woods used for fine furniture contain poisons having a similar effect. Of plants having poison in hairs, *Primula obconica* and, to a lesser degree, *P. sinensis, P. mollis, P. Sieboldi, P. cortusoides,* and *P. Arendsi* are known as eczema plants. They produce less poison when well watered. Washing with alcohol immediately after handling the plants is recommended. Of plants with eczema-producing milk or gum, *Rhus toxicodendron* is well known, but other species should also be indicated.—*Ernst Gram.*

5909. Dean, A. L., and R. Wrenchall. **Making Chaulmoogra oil derivatives.** Pharm. Era **55:** 277, 278. 1922.—The authors describe routine methods used at the University of Hawaii for making certain derivatives of Chaulmoogra oil for therapeutic use.—*C. M. Sterling.*

5910. Dodd, Sydney. **Poisoning of sheep by "Narrawa burr," Solanum cinereum.** Agric. Gaz. New South Wales **34:** 257–260. 1923.—A sheep fed the berries emulsified in water died within 7 hours, with symptoms of salivation, perspiration, disordered cardiac and respiratory actions, and diarrhoea. The active toxic agent is probably solanin. *L. R. Waldron.*

5911. Girola, Carlos D. **Cultivo de la Yerba Mate en Argentina. Composicion del Ilex paraguariensis. [Cultivation of Yerba Mate in Argentina. Composition of Ilex paraguariensis.]** Bol. Ministerio Agric. Nacion [Argentina] **27:** 186–219. *4 fig.* 1922.—The author summarizes all previous work covering analyses of *Ilex paraguariensis,* the plant yielding Yerba Mate or Paraguay tea, with particular reference to the ash and to fresh and dried leaves and their products. [See also Bot. Absts. 12, Entries 5661, 5662.].—*John A. Stevenson.*

5912. Girola, Carlos D. **Plantas medicinales. Posibilidad del cultivo de las especies exoticas en Argentina. [Medicinal plants. Possibility of the culture of exotic species in Argentina.]** Bol. Ministerio Agric. Nacion [Argentina] **25:** 175–209. 1920.—The author outlines the progress in the study of medicinal plants in the U. S. A., Uruguay, Brazil, Chile, Paraguay, Canada, and various European countries. A list of medicinal plants cultivated in the botanical garden at Buenos Aires is given.—*John A. Stevenson.*

5913. Hart, Fanchon. **Curatella americana.** Druggists Circ. **66:** 296, 314. *4 fig.* 1922. —This is the 1st plant reported upon from the collection made by Rusby of the Mulford expedition to South America. The writer describes the tree, its habitat and uses, and reports a microscopical study of the leaves, which, because of their rough, flinty trichomes, are used as substitute for sandpaper for polishing canes and other wood-work. The bark is used as an astringent.—*C. M. Sterling.*

5914. Havermanns, Aug. **Plaatselijke dier- en kruidkunde. [Local zoology and botany.]** Natuurw. Tijdschr. **4:** 184–190. 1922.—In Belgium *Datura stramonium* seed are given to hogs to lengthen sleep and to stimulate appetite, although many deaths result from this practice.—*J. C. Th. Uphof.*

5915. Kraemer, Henry. **The wealth of out doors.** Druggists Circ. **66:** 431, 432. *1 fig.* 1922.—This is an account of the introduction and distribution of *Hyoscyamus* in Montana.—*C. M. Sterling.*

5916. Shiflett, B. O. **Common medicinal plants.** Amer. Druggist and Pharm. Rec. **70:** 1922.—The value of botany to the pharmacist is emphasized and drug plants native to Alabama are listed.—*C. M. Sterling.*

5917. Simonsen, John Lionel, and Madyar Gopal Rau. **The constituents of Indian turpentine from Pinus longifolia Roxb. Part II.** Jour. Chem. Soc. [London] **123:** 549–560. 1923.

5918. Youngken, H. W. **A text book of pharmacognosy.** *x + 538 p., 210 fig.* P. Blakiston's Son and Co.: Philadelphia, 1921.—The text is divided into 2 parts. Part 1 embraces 2 chapters, 1 of which deals with fundamentals such as the occurrence of crude drugs, causes of their variation in quality, definitions, collection of drugs, curing of drugs, garbling, valuation of drugs, drug preservation, and a brief history of the subject. The other considers crude vegetable drugs from the morphological standpoint. Part 2 deals with the taxonomy of crude drugs, and embraces 2 chapters in which crude drugs of vegetable and animal origin are respectively treated as to division, class, family, synonyms, natural origin, part used, limit of impurities, ash, habitat, description of plant or animal yielding drug, commercial source, description of drug, microscopical characterstics, powdered drug, constituents, adulterants, and substitutes.—*Author's abstract.*

PHYSIOLOGY

B. M. Duggar, *Editor*

William J. Robbins, *Assistant Editor*

(See also in this issue Entries 5289, 5317, 5342, 5375, 5422, 5432, 5437, 5438, 5439, 5440, 5441, 5484, 5562, 5633, 5741, 5752, 5785, 5805, 5806, 5807, 5820, 5838, 5839, 5841, 5845, 6026, 6030, 6031, 6032)

GENERAL

5919. Anonymous. [Rev. of: Palmer, Leroy S. **Carotinoids and related pigments: the chromolipoids** *316 p.* (American Chemical Society Monograph Series.) The Chemical Catalog Co.: New York, 1922 (see Bot. Absts. 12, Entry 2763).] Nature **111**: 318–319. 1923.

5920. Hill, A. V. **Hydrogen ion concentration.** Nature **111**: 434–436. 1923.—This is a general discussion of the subject.—*O. A. Stevens.*

5921. Hutchinson, C. M. **Report of the Imperial Agricultural Bacteriologist.** Sci. Rept. Agric. Res. Inst. Pusa **1921-22**: 38–43. 1922.—Work was done on nitrogen fixation; symbiosis between algae and nitrogen-fixing bacteria; plant residues as nutrients for nitrogen-fixing bacteria; and on cross inoculations with nodule bacteria. Studies on nitrification of *Bassia latifolia* cake and solubilization of rock phosphates by composting were continued. The most effective compost tried consisted of 50 gm. Bassia cake, 25 gm. nodule phosphate, and 6.25 gm. sulphur, and this yielded 4.32 per cent of citrate-soluble phosphate(P_2O_5). The study of nitrogen loss from cattle dung and urine stored under various conditions was continued. Burned soil from the Konkan Division contained more nitrogen (as ammonia) than the fresh soil. Experimental plots were laid down for the study of sodium nitrate as a fertilizer in connection with irrigation; the vertical distribution of nitrates in the soil; and the influence of cultivation, rainfall, and applications of nitrate on nitrification.—The study of the classification and efficiency of indican hydrolyzers, and experimental work on small apparatus for local manufacture of the sterilizer "E. C." were carried on. A program of work for 1922–23 and a list of publications for the year are appended.—*Winfield Dudgeon.*

PROTOPLASM, MOTILITY

5922. Dangeard, P. A., et Pierre Dangeard. **Sur la vitalité des feuilles d'Aucuba conservées dans le vide.** [**The vitality of the leaves of Aucuba preserved in a vacuum.**] Compt. Rend. Acad. Sci. Paris **176**: 49–53. 1923.—In conformity with the experiment of Maquenne and Demoussy [see Bot. Absts. 12, Entry 4567] adult leaves of *Aucuba* were kept in a vacuum in light for 6 months and still retained their vitality. The cells were all alive, there being no apparent difference between the cells of the treated leaves and of those still remaining on the tree. Two proofs that life still existed are given: (1) there was observed a streaming of the protoplasm within the cells. This is especially true of the epidermal cells, the guard cells, and the cells near the veins. (2) Intravital staining with neutral red and cresyl blue. These dyes

accumulate in the vacuole, leaving the nucleus, cytoplasm, and plastids unstained. In all these respects the exposed and control leaves behaved the same, both in living and fixed material.—*C. H. Farr.*

5923. Funk, Georg. **Über Bewegungen der Kolonien von Oscillatoria amphibia Ag. [Movements of the colonies of Oscillatoria amphibia.]** Beih. Bot. Centralbl. I Abt. 39: 257–320. *Pl. 17–18. 14 fig.* 1923.—The colonies contract by the creeping together of the filaments and thin out by the moving out of the individual filaments. Contraction of the whole colony results from mechanical stimulus, darkening, increased light, cooling, and heating.—*L. Pace.*

DIFFUSION, PERMEABILITY PHYSICO-CHEMICAL PHENOMENA

5924. Churchman, John W. **The mechanism of selective bacteriostasis.** Proc. Nation. Acad. Sci. [U. S.] 9: 78–81. 1923.—While most of the triphenylmethane stains kill or inhibit gram-positive bacteria but do not readily affect gram-negative forms, the author finds that acid fuchsin has a similar selective effect on gram negative bacteria. Such selective effects do not seem to depend on penetrability; stained bacteria may grow and unstained ones may be inhibited. The bacteriostatic effect evidently is "a paralysis of reproduction," not always leading to death. Bacteriostasis due to staining before culturing is defined as intrinsic, and that due to dye in the culture medium as extrinsic. With gentian violet, intrinsic and extrinsic bacteriostasis are parallel, a given organism being inhibited or not in both cases; with acid fuchsin, 1 of 2 organisms may show intrinsic bacteriostasis only, and the other, extrinsic only. —*Howard B. Frost.*

5925. Dorner, Alfred. **Über das Verhalten der Zellwand zu Kongorot, insbesondre bei Farnprothallien. [The behavior of the cell wall to congo red, especially in fern prothallia.]** Centralbl. Bakt. II Abt. 56: 14–27. 1922.—This investigation was undertaken to test Klebs' theory that congo red is a differential stain for living and dead cell walls. Fern prothallia as well as material from a number of higher and lower plants were studied in this respect. It was found that no absorption took place in any case where the presence of a cuticle could be demonstrated. However, when cutinized cell walls were treated with cutin solvents the dye was readily taken up.—*Anthony Berg.*

5926. Dorner, Alfred. **Über die Aufnahme von Anilinfarbstoffen in das Protoplasma und die Zellwand.** (Sammelreferat.) **[The absorption of aniline dyes by the protoplasm and the cell wall.]** Centralbl. Bakt. II Abt. 56: 27–31. 1922.—This is a résumé of the theories promulgated by the various investigators on the absorption of these dyes.—*Anthony Berg.*

5927. Kakiuchi, Samuro. **Studies on physico-chemical properties of phospholipin. I. The precipitation of lecithin-hydrosol by electrolytes.** Jour. Biochem. Tokyo 1: 165–174. 1922.—Lecithin particles in aqueous solution are negatively charged; salts with a monovalent cation exert no precipitating action; bivalent cations precipitate over a wide range of concentration; trivalent cations precipitate only within a very narrow range of concentration and at very great dilution, causing resolution of the precipitate if the concentration of electrolyte be too great. The valency of the anion of the salt used plays a role in the result; monovalent anions are practically without effect upon the concentration of trivalent cation required to precipitate, while the presence of divalent or tetravalent anions with their large negative charges necessitates a material increase in the concentration of cation necessary to precipitate. Many supposed instances of antagonism between salts with monovalent and bivalent cations are in reality due to antagonism between cations and anions.—*Joseph S. Caldwell.*

5928. Kotake, Yashiro, and M. Okagawa. **Über den Einfluss des optischen Drehungsvermögens auf die Zell-permeabilität. I Mitteilung. [The influence of optical rotation upon cell-permeability.]** Jour. Biochem. Tokyo 1: 159–164. 1922.—Of the 3 forms of oxyphenyl-lactic acid, the red corpuscles of the dog are readily permeable only to the laevorotatory

form, slightly permeable to the dextrorotatory form, and not at all to the inactive form. Optical activity may play a rôle of unsuspected importance in biological and physiological relations.—*Joseph S. Caldwell.*

5929. Price, Thomas Slater. **Determination of the isoelectric point of gelatin. A criticism of Patten and Kellems's method.** Jour. Chem. Soc. [London] 123: 410–412. *1 fig.* 1923.

5930. Stiles, Walter. **Permeability.** New Phytol. 21: 169–209, 233–251. 1922; 22: 1–29, 72–94. *Fig. 13–14.* 1923.—After a general statement, with a definition of turgidity, in Chapter IX the quantitative water relations of the cell are considered on the basis of the simple osmotic view. The net pressure sending water into the cell is called the "suction pressure." The 3 methods most used for the determination of the isotonic coefficient are given, and 3 methods for determination of the osmotic pressure of the cell. The magnitude of the osmotic pressure and the relation between the position of a cell in the plant and its osmotic pressure are discussed, along with the relation of habit to osmotic pressure, the influence of external conditions, and the phenomenon of periodicity in the pressure values. Other subjects included are the substances responsible for osmotic pressure, the suction pressure and its determination, the magnitude and range of suction pressures, exudation and root pressure, the inadequacy of the simple osmotic view, the water relations of the cell wall and of the protoplasm, and the effect of imperfect permeability of the cell wall and of tissue tensions on the water relations of cells. Chapter X is devoted to a consideration of the influence of temperature and of the composition of the external medium on the intake and excretion of water in plants. The effect of temperature has been studied by the plasmolytic method, by the rate of linear shrinkage of turgid tissues, and by "the change in weight method." The effect of the composition of the external medium is discussed with special reference to sucrose, sodium chloride, ethyl alcohol, octyl alcohol, chloroform, mercuric cyanide, sulphuric acid, osmic acid, mercuric chloride, ethylic acetate, and the phenols.—In Chapter XI the author considers the methods for determining the permeability of plant cells to dissolved substances. These methods are: direct observation of visible changes, microchemical tests, analysis of expressed sap or tissue extracts, visible changes in the external medium, chemical analysis of the external medium, electrical conductivity of the external solution, electrometric measurements with the hydrogen electrode, colorimetric estimation of the H-ion concentration of the external solution, metabolic action, plasmolysis, weight or volume changes in turgid tissues, tissue tension, diffusion, and electrical conductivity of living tissues —Chapter XII consists of a discussion of "quantitative relations in the penetration of dissolved substances into plant cells." The subheads are: "the unequal absorption of the ions of a salt by plant tissue," "the position of the equilibrium attained in the intake of dissolved substances by plant cells," and "the course of absorption of dissolved substances."—*I. F. Lewis.*

5931. Tadokoro, Tetsutaro. **The antagonistic action between salts on the surface tension of organic colloidal solution.** Jour. Biochem. Tokyo 2: 361–365. 1923.—The alterations in surface tension of expressed, centrifuged vegetable juices and horse serum produced by additions of single salts or of antagonistic pairs of salts were determined by means of Nouy's surface tension apparatus. A mixture of antagonistic salts preserves the surface tension unaltered while each of the single salts depresses it, but the alterations produced are small and there are many irregularities.—*Joseph S. Caldwell.*

5932. Tadokoro, Tetsutaro, and Yukihiko Nakamura. **On the difference between the adsorptive powers of charcoal from common and glutinous starch.** Jour. Biochem. Tokyo 2: 239–250. 1923.—Certain varieties of rice, millet, and Italian millet possess starch which gives with iodine a red or purple color; these are the so-called glutinous varieties. Starches made from glutinous and common varieties of each of the 3 grains were purified, converted into charcoal, and tested for adsorption of iodine in potassium iodide. The adsorption was in all cases materially greater in the glutinous starch charcoals. Impregnation of the glutinous

starch charcoal with potassium or calcium chloride increased its adsorptive capacity, calcium nitrate and tannin were without effect, and iodine in potassium iodide decreased adsorptive capacity. The adsorptive capacity of the gel from glutinous starch was greater than that from common starch; it also requires a larger quantity of tannin to precipitate it, and the surface tension as measured by Nouy's apparatus changes abruptly with increase of tannin, while a gradual change occurs in common starch so treated.—*Joseph S. Caldwell.*

WATER RELATIONS

5933. Boswell, Victor R. **Dehydration of certain plant tissues.** Bot. Gaz. 75: 86–94. *Fig. 1–7.* 1923.—Under oven dehydration at 60°C. the author's data, taken at 15-minute intervals, showed that cabbage leaves lost water less rapidly than did tomato leaves. Contrasting results were also found in tender (greenhouse-grown) and hardy (coldframe-grown, March) cabbage leaves. Tomato leaves similarly grown showed little difference. Greenhouse-grown cabbage leaves, produced from plants which were watered with (1) tap water, (2) $\frac{N}{10}$ NaCl, (3) $\frac{N}{10}$ $NaNO_3$, gave results indicating a relation of hardiness to these treatments, the tap water producing the tender leaves and the $NaNO_3$ the hardiest leaves. The author's graphs "show conclusively that there is a close correlation between the degree of hardiness and the rate of water loss." The author finds that hardy tissue loses its water more slowly in the early periods than does the tender tissue. "The results suggest that the method of drying described in the present paper may be used to estimate the relative amounts of free and unfree water in plant tissues, and that the comparative rates of water loss under uniform drying conditions are a measure of the relative hardiness of certain kinds of plant tissues."—*B. W. Wells.*

5934. Priestley, J. H., and R. M. Tupper-Carey. **Physiological studies in plant anatomy. IV. The water relations of the plant growing point.** New Phytol. 21: 210–229. *Fig. 1–2.* 1922.—In *Vicia Faba* it is shown that fluid under pressure does not penetrate the meristem at the root apex. A pressure of 1 atmosphere failed to cause the penetration of aqueous eosin, while the meristem resisted a pressure of 2 atmospheres without penetration of malachite green. The meristem of the root tip "is relatively impermeable to the diffusion of salts in solution and acid dyes but stains very readily with basic dyes." The resistance of the living root meristem varied from 2,000 to 10,000 ohms, while in killed roots the resistance fell to a few hundred ohms. In root tips taken from the dry bean and soaked 1 hour in water, the resistance of the meristem averaged 12–13,000 ohms.—On the other hand "the stem apex allows relatively free diffusion of water and solutes within the cuticle, the meristematic protoplasts at the apex staining readily with acid dyes. * * * The sap contained in the endodermal cylinder of the root is apparently more acid than the sap irrigating the stem apex. * * * The relative ease with which the apical meristem of the stem is irrigated with substances, as compared with the supply of these substances to the root apex, is shown to suggest a physiological basis for the important morphological differences characteristic of these 2 growing points."—The experimental results are in direct conflict with Coupin's theory that the growing point is the chief organ of the root for the absorption of water and solutes.—*I. F. Lewis.*

MINERAL NUTRIENTS AND SALT RELATIONS

5935. Haas, A. R. C. **Pot cultures with barley in soil from a long-time fertilizer experiment.** Bot. Gaz. 75: 95–102. *Fig. 1–4.* 1923.—The soil used to test the effects of the fertilizers was from the orange and lemon tree plots of the Citrus Experiment Station, Riverside, California. The purpose of the experiment was to discover whether or not a cereal like barley would respond to the various combinations of fertilizers in a manner similar to the citrus plants. The author finds a "lack of agreement between the barley-producing form of soils and the yield and condition of citrus on such soils at the time the samples were taken." On a plot fertilized by nitrate, blood, and potassium sulphate, much less grain was produced than would be assumed from the yield of citrus. The writer was further able to demonstrate that the amount of nitrogen previously added to the soil is not an accurate measure of its barley-producing power, and also that "the addition of phosphoric acid or potash to the soil studied has not shown any added advantages for the growth of barley."—*B. W. Wells.*

5936. Hesselink, E. **Zoutwaterschade bij Grienden aan het Hollandsch Diep. [Salt-water injury near Grienden on the Hollandsch Diep.]** Cultura 35: 67–71. *2 pl., 1 fig.* 1923. An account is presented mainly of the influence of seawater upon willows in inundated fields. It was not difficult to show by flame reaction the presence of NaCl in willow twigs. Not all species are susceptible to the same degree. *Salix viminalis* is most susceptible, then follows *S. amygdalina*, still less *S. vitellina*, and most individuals of *S. alba* are not harmed at all. Also, *S. purpurea* was often badly damaged. It was observed that injury was least in a field where the ditches were cleaned the previous winter, and the mud thrown between the shrubs. It is supposed that it prevented the seawater entering the lower layers of the soil and salt was thus unable to reach the roots. In the field where the ditches were not treated the damage was considerable. There was less NaCl toward the base of the twigs than in the top, which explains why damage is first noticed on the leaves. Cuttings were grown in pots in order to observe the influence of salt water. On May 16 tap water was mixed with 20 per cent seawater, and after 2 days no harmful influence was noticed. During the next 2 days the cuttings were watered with pure seawater and after 2 days all plants were killed.—*J. C. Th. Uphof.*

5937. Müller, Wilhelm. **Über die Abhängigkeit der Kalkoxalatbildung in der Pflanze von den Ernährungsbedingungen. [The dependence of calcium oxalate formation in plants on the nutritive condition.]** Beih. Bot. Centralbl. 1 Abt. 39: 321–351. 1923.—Amars and Benecke showed that calcium oxalate formation in green plants depends on nutrition. Calcium oxalate crystals, whether in living or dead cells, are not dissolved in the assimilation processes of any plant, but in contact with the roots such crystals were attacked and corroded. The raphide content did not vary with different nitrogenous sources, and was influenced only by calcium supply. In the absence of nitrogenous material the raphide content is unchanged. Raphide formation requires less calcium than the formation of other oxalate crystal. Light does not influence the formation of raphides. The greater part of the investigation confirms Stahl, whose work appeared after this work was completed.—Plants used in the experiment were *Callisia repens* L., *Stellaria media, Impatiens parviflora* DC., *I. Sultani* Hook., *Mimosa Speggazzinii, Nicotiana Tabacum, Solanum tuberosum* L., *Datura Stramonium* L.—*L. Pace.*

5938. Snell, Karl. **Die Kartoffel in Sand- und Wasserkulturen. [The potato in sand and in water cultures.]** Illus. Landw. Zeitg. 43: 59–60. 1923.—The experiments showed the extremely favorable results from the presence of potassium salts in the culture media. In both sand and water cultures the plants matured, producing all parts including tubers. In the water cultures the tubers possessed enlarged white lenticels and the leaves became rolled in late summer as usually occurs in the field when there is insufficient water. The author suggests that the curling was probably due to a lack of necessary salts, since the salt solution was not renewed.—*John W. Roberts.*

PHOTOSYNTHESIS, PHOTOCHEMISTRY

5939. Heilbron, I. M. **The photosynthesis of plant products.** Nature 111: 502–504. 1923.—This article is an abstract of lectures delivered at the Royal Institution on Feb. 1 and 8, and it contains references to the work of Willstätter and more especially to that of Moore and Webster on carbohydrate production. Several investigations in nitrogen assimilation are referred to. "Photosynthesis is in the main the chemistry of one single substance—formaldehyde."—*O. A. Stevens.*

5940. Noyes, W. Albert, and A. B. Kouperman. **Photochemical studies 1. The photochemical decomposition of solid oxalic acid.** Jour. Amer. Chem. Soc. 45: 1398–1400. 1923.

METABOLISM (GENERAL)

5941. Arnold, R. **Application du procedé biochimique de caractérisation du glucose aux fruits de Viburnum opulus L., à l'extrait de Quinquina rouge et à des extraits de Cola. [Application of the biochemical method to the identification of glucose in fruits of Viburnum**

opulus L., and in extracts of red cinchona and kola.] Bull. Soc. Chim. Biol. 3: 547–566. 1921. —Continuing earlier work by Bridel and Arnold [see Bot. Absts. 12, Entry 5189] in which methods for preparation of material for study were described, the present article reports results with the 3 materials named. 100 gm. of unripe fruits of *Viburnum opulus* contained 5.766 gm. of reducing sugar, increasing to 6.232 gm. after treatment with invertase, but showing no further increase after the action of emulsin. By submitting the mixture of reducing sugars to the action of emulsin in 50 per cent methyl alcohol and determining the amount of sugar converted into *b*-methylglucoside, it was found that dextrose constituted 56.6 per cent of the mixture of reducing sugars. That the remainder was levulose was indicated by the optical rotation. Red cinchona extract prepared according to the Codex of 1908 contained 9.78 per cent reducing sugars, of which 43.6 per cent was dextrose as determined by conversion into methylglucoside. Extract of kola made according to the Codex of 1908 was compared with a preparation made from the fresh nut. In the official extract, 53.7 per cent of the reducing sugars was dextrose; when the extract was subjected to hydrolysis with sulphuric acid followed by treatment for 140 days with emulsin renewed at 30-day intervals the dextrose found was 43.95 per cent of the reducing sugar. An extract of the fresh kola nut was very slowly acted upon by emulsin, 21.78 per cent of the reducing sugar present being dextrose. After H_2SO_4 hydrolysis the dextrose present was 48.8 per cent of the reducing sugar. The "biochemical method" as applied to plant material consists in the destruction of enzymes by placing the material in boiling alcohol, extracting with water, clarifying with lead subacetate, removing excess lead with H_2S, extracting with boiling acetic ether to remove lipoids, resins, alkaloids, and glucosides, dissolving out the sugars with boiling 95 per cent alcohol, evaporating to dryness, dissolving in 50 per cent methyl alcohol, and adding emulsin after previous determination of reducing sugar in an aliquot. Repeated additions of emulsin may be necessary to bring the reaction to completion, and complete extraction of sugars with 95 per cent alcohol is difficult in such material as red cinchona.—*Joseph S. Caldwell.*

5942. Boas, Friedrich. **Untersuchungen über Säurewirkung und Bildung löslicher Stärke bei Schimmelpilzen. II Teil. [Acidity and the formation of soluble starch in mucors. Part II.]** Centralbl. Bakt. II Abt. 56: 7–11. 1922.—The H-ion concentration, nature of the carbohydrate source, and temperature are important factors in the formation of soluble starch. Saccharose, levulose, dextrose, maltose, and galactose stimulate the formation of diastase in the order named. The presence of diastase in the nutrient solution inhibits the appearance of soluble starch. In *Aspergillus niger* there seems to be a relationship between the formation of diastase and conidia formation; maltose and galactose seem to favor conidia production. In *Aspergillus Oryzae* maltose favors the appearance of soluble starch in the nutrient solution; levulose seems to inhibit it.—*Anthony Berg.*

5943. Delauney, P. **Nouvelles recherches relatives à la présence de la loroglossine dans les Orchidées indigènes. [The presence of loroglossin in indigenous orchids.]** Compt. Rend. Acad. Sci. Paris 176: 598–600. 1923.—Eleven species are added to the list of those in which this substance has been found. This makes a total of 17 species of indigenous orchids belonging to 5 genera, namely: *Loroglossum, Orchis, Ophrys, Cephalanthera,* and *Epipactis.*—*C. H. Farr.*

5944. Goto, Kiko. **The nature of the carbohydrates in the leaf, stem and tuber of Amorphophallus Konjaku and their variations in amount under different conditions.** Jour. Biochem. Tokyo 1: 201–211. 1922.—The mature resting tubers contained 58.8 per cent mannan, 18.85 per cent starch, 0.57 per cent dextrose, and 1.2 per cent levulose. Mannan and starch are depleted together as the growth of the new plant begins, and both are found in all parts of the plant at all stages of growth. Starch wholly disappears from leaf and stalk and only a trace remains in the tuber when vigorously growing plants are placed in the dark for 2 months. Dextrose and levulose are found in the leaves and stalks in approximately equal amounts and are the only sugars found; tests for sucrose, mannose, pentose, and methyl pentose made upon stems, leaves, and stalks of growing plants invariably gave negative results.—*Joseph S. Caldwell.*

5945. Herissey, H., et P. Delauney. **Présence dans plusieurs Orchidées indiginès de glucosides fournissent de la coumarine par hydrolyse. [Presence in several indigenous orchids of glucosides yielding coumarin on hydrolysis.]** Bull. Soc. Chim. Biol. 3: 573–579. 1921.—Coumarin in the free state is not present in *Orchis purpurea* Huds., *O. Simia* Lam., or *O. militaris* L. It can be isolated from each of these after the plant has been subjected to digestion by a preparation of its own enzymes, to hydrolysis by dilute sulphuric acid, to slow drying at a low temperature, or to successive treatment with invertase and emulsin. It is accompanied by an oily substance having the characteristic odor of orchids, which interferes with crystallization. The glucoside which yields coumarin is distinct from loroglossin. No coumarin could be obtained from *Orchis maculata* L. or *O. conopsea* L.—*Joseph S. Caldwell.*

5946. Irvine, James Colquhoun, and Edmund Langley Hirst. **The constitution of polysaccharides. Part VI. The molecular structure of cotton cellulose.** Jour. Chem. Soc. [London] 123: 518–532. 1923.

5947. Koganei, Ryoichi. **Studies on the fatty substances of tubercle bacilli and their acid-proof staining property.** Jour. Biochem. Tokyo 1: 355–364. 1922.—Successive extractions with cold and hot alcohol, ether, and acetone divided the lipoid material into 3 fractions. The portion soluble in hot alcohol yielded an ether-insoluble fraction which contained phrenosin, kerasin, and sphingomyelin. The aceton-soluble portion consisted principally of glycerides but no cholesterol. The ether-soluble, acetone-insoluble portion was made up of about 20 per cent of kephalin and 80 per cent of tubercle-wax closely approximating cetin in its physical properties. Each of the new constituents was tested in pure form as to its acid-proof staining properties, with the result that kephalin, whether from tubercle bacilli or from ox brain, yielded an intense acid-proof color with the Ziehl-Neilsen's stain. This was not the case with sphingomyelin, kerasin, phrenosin, cetin, palmitic acid, and various glycolipins which were subjected to the test.—*Joseph S. Caldwell.*

5948. Komatsu, Shigeru, and Hidenosuke Ueda. **On the biochemical study of the ripening of the Kaki-fruit I. Chemical composition of the fruit.** Jour. Biochem. Tokyo 1: 181–194. 1922.—Non-astringent and astringent varieties of *Diospyros Kaki* when examined by ordinary methods of analysis show no differences which account for the differences in astringency. The authors made a detailed examination of mature fruits of 2 astringent and 2 non-astringent varieties which were found to differ only very slightly in their sugar content. In all cases, sucrose made up less than 10 per cent of the total carbohydrate, the remainder consisting of a mixture of dextrose and levulose in which dextrose predominates. The tannin of both varieties, when prepared free from polysaccharids, reduces Fehling's solution. The pectins of sweet and astringent varieties differ very considerably in their elementary composition from each other and are to be further investigated.—*Joseph S. Caldwell.*

5949. Komatsu, Shigeru, and Hidenosuke Ueda. **On the biochemical study of the ripening of the Kaki-fruit. II.** Jour. Biochem. Tokyo 2: 291–300. 1923.– The transformation of the carbohydrates during the ripening of a sweet (non-astringent) variety of persimmon known as Ansai, were studied in a series of 16 samples collected over the period Sept. 20–Dec. 7. The 1st samples were green and strongly astringent. Ripening occurred early in October, as indicated by color and flavor, while increase in weight of the fruit continued to Nov. 2. Expressed as percentages of dry matter, there is a progressive though somewhat irregular increase in total sugars from 57.36 per cent on Sept. 21 to 70.16 per cent on Nov. 15, after which there is a decrease to 63.37 per cent on Dec. 7. The curve for reducing sugars runs closely parallel with this, the figures being 56.28 per cent on Sept. 21, 66.08 per cent on Nov. 15, and 62.30 per cent on Dec. 7. Cane sugar increases from 1.08 per cent on Sept. 21 to a maximum of 5.29 per cent on Oct. 14, fluctuates between 4.94 per cent and 3.82 per cent from Oct. 16 to Nov. 15, and drops to 1.07 per cent on Dec. 7. Glucose at all times exceeds fructose, the glucose-fructose ratio being 1.62:1 on Sept. 21, rising to 1.85:1 on Oct. 3, then remaining fairly close to 1.60:1 until Nov. 15, when it drops to 1.19:1. Acidity, expressed as malic acid, was 0.94 per

cent on Sept. 21, decreasing steadily to a minimum of 0.333 per cent on Oct. 24, after which it increased again to 0.436 per cent on Nov. 15 and Dec. 7. Tannin, estimated as gallotannin, made up 4.28 per cent of the dry weight on Sept. 21, decreasing to 0.604 per cent on Oct. 10, remaining about this point to Oct. 24, when it dropped to 0.34 per cent, with a further decrease to 0.18 on Dec. 7. Polysaccharids and crude fiber make up 4.5 and 7.2 per cent, respectively, of the dry weight on Sept. 21, both decreasing somewhat irregularly to 2.44 and 5.53 per cent on Dec. 7. The yield of pentose obtained upon acid hydrolysis of the polysaccharids increased steadily up to Nov. 15, then fell off; the yield of hexoses was fairly constant up to Oct. 24, after which it steadily declined. Pectin constituted 4.9 per cent of the total dry weight on Sept. 21, increased to 6.30 per cent on Sept. 30, decreasing with irregular fluctuations to 3.03 per cent on Nov. 2, and remained practically constant after that date. Extraction of the water-insoluble residue with sodium carbonate showed that the decrease in soluble tannin was due to its conversion into a brown insoluble form The authors "find no chemical evidence in our results to support the theory that the shibu (tannin) becomes insoluble on combining with pectin or some other substance," as Kumagai and Tozaki (Jour. Sci. Agric. Soc. Japan No. 236.360. 1922) have suggested. They regard the shibu as a phlobatannin.—*Joseph S. Caldwell.*

5950. Komatsu, Shigeru, Hidenosuke Ueda, and Motaro Ishimasa. **On the biochemical study of the ripening of the Kaki-fruit III. Chemical composition of the cured fruit.** Jour. Biochem. Tokyo 2: 301–308. 1923.—An astringent variety of persimmon (Momidzu) was "cured" to remove astringency in each of 3 ways—by immersion in warm water, by placing in alcohol vapor, and by peeling and drying in the sun. Dry samples of a number of other astringent varieties were also examined. The white powder which collects upon the surface of the sun-dried fruits is composed of 90 per cent dextrose and 10 per cent levulose, although the 2 sugars are present in the fruit in approximately equal quantities, or with glucose slightly in excess. Sucrose was absent from the fruit cured in warm water, and present as a trace only in that cured in alcohol vapor. Sun-dried fruits contained small amounts, less than 1 per cent, of sucrose. The pectin and tannin of the dry samples of different varieties showed considerable varietal differences, being 1.4 per cent and 0.13 per cent, respectively, for the variety Dôjôhachiya, 0.48 per cent and 0.66 per cent for Oshiba.—*Joseph S. Caldwell.*

5951. Komatsu, Shigeru, and Hidenosuke Ueda. **On the biochemical study of the ripening of the Kaki-fruit IV. Chemistry of the curing process.** Jour. Biochem. Tokyo 2: 309–313. 1923.—The chemical changes occurring in 3 astringent varieties of persimmon, Yakigaki, Marugaki, and Momidzu, during slow desiccation in the air were studied in comparison with samples of Momidzu "cured" (rendered non-astringent) by immersion in warm water and treatment with alcohol vapor. When Momidzu fruits containing 18.1 gm. reducing sugar in which the glucose-fructose ratio was 1.7 : 1 were cured in warm water [temperature and length of immersion not stated] the reducing sugar content decreased to 13.9 gm. with a glucose-fructose ratio of 1.4:1. In other samples cured in alcohol vapor [details of treatment not stated] the reducing sugar content decreased to 15 gm. with a glucose-fructose ratio of 1.5:1. The soluble tannin content of the water-cured fruit was 14.2 per cent, that of the alcohol-cured fruit 5.9 per cent, of that of the fresh fruit. Fruits of Momidzu desiccated by exposure to the air for 210 days contained only 11.3 gm. reducing sugar with a glucose-fructose ratio of 1.3:1. In the same period and under the same treatment Yakigaki lost 43 per cent of its reducing sugar and had the glucose-fructose ratio decreased from 1.5:1 to 1.1:1, while Marugaki lost 40 per cent of its sugar with an alteration of the glucose-fructose ratio from 1.6:1 to 1.4:1. That the loss of dextrose is proportionately greater than that of levulose is due primarily to the greater ease with which it is decomposed in respiration, in minor degree to the fact that the deposit of crystallized sugar upon the surface of the dried fruits is about 90 per cent dextrose. The authors ask, but do not answer, the question whether the composition of this deposit is due to a difference in the velocities of diffusion of the 2 sugars through the cell membranes or to other reasons. That the desiccated fruit is apparently sweeter than that cured by other processes is due to the larger proportion of levulose present after drying. The ripening of a non-astringent variety, Ansai [see Bot. Absts. 12, Entry 5949], and the air-drying of the astringent varie-

ties are similar in that the outstanding changes in both cases are reduction of soluble tannin by conversion to an insoluble form, decrease in acid content, and decrease of the glucose-fructose ratio.—*Joseph S. Caldwell.*

5952. Lindet, L., et P. Nottin. **Évolution des grains de fécule dans le tubercle de la pomme de terre. [The development of the starch grains of the potato tuber.]** Compt. Rend. Acad. Sci. Paris **176**: 149–155. 1923.—A study is made of the development of the tubers as to increase in weight, quantity of starch, and increase in dimensions of starch grains. The sugar content varies from 0.5 to 1.5 per cent of the sap. The amylogene probably contains a mixture of the sugars sucrose, invert sugar, and perhaps maltose. Soluble starch might also be expected, but it could not be detected with anhydrous Na_2SO_4 or $MgSO_4$. A study is made of the individual starch grains. By measuring the diameter of grains it was possible to calculate their volume and weight, the latter through weighing a million grains of the same size. A means is described for isolating grains of a common size. The formula, $P = 3.26\ R^3$, gives the weight in mgm. of a starch grain, if R is the radius of the grain in microns. It is found that over half of the grains measure from 0μ to 10μ, but these comprise only 1.53 per cent of the total weight of starch grains. Only 0.6 per cent of the grains are from 60μ to 80μ. These comprise 19.2 per cent of the total weight. The maximum size is 100μ. The starch grains are about of equal size in all parts of the mature tuber. When the tubers sprout the starch grains nearer the buds become smaller. Simultaneously the sugar content increases to 70 per cent of the sap.—*C. H. Farr.*

5953. Ling, Arthur Robert, and Dinshaw Rattonji Nanji. **The preparation of xylose from maize cobs.** Jour. Chem. Soc. [London] **123**: 620–621. 1923.—The method is described in detail. The yield of pure xylose was 10–12 per cent of the weight of cobs used.—*F. E. Denny.*

5954. Mangenot, G. **Sur l'amidon des Algues Floridées. [The starch of the red algae.]** Compt. Rend. Acad. Sci. Paris **176**: 183–185. 1923.—In general the starch of the red algae is quite constant in character. With the iodine stain it varies from brown to violaceous. The form of the grains is variable. When of average size they are irregularly polyhedric; when very long they are either concave discoid or ovoid, with hilum and rings very faint. They are found in plastids in close association with the nucleus. The distribution of starch in the tissues is discussed and also the hydrolysis of starch into sugar.—*C. H. Farr.*

5955. Miyake, Sugura. **Chemical studies of corn pollen. I. Isolation of phytosterol and inosite.** Jour. Biochem. Tokyo **2**: 27–32. 1922.—The present work is a continuation of earlier studies reported by the author in Jour. Soc. Agric. and Forest. Sapporo, Japan, in 1919 and 1921. The results of Anderson and Kulp (Analysis and composition of corn pollen. Jour. Biol. Chem. **50**: 433–453. 1922), who reported the presence of inosite in corn pollen, are confirmed, the author having obtained the pure crystals from the alcoholic extract of pollen previously extracted with ether in sufficient quantity to make melting point, combustion, and molecular weight determinations in addition to the usual color tests. Phytosterol was obtained from the ether extract, purified by recrystallization from absolute alcohol, and identified by melting point, solubility, and the usual color reactions. The nature of the carbohydrates of corn pollen (Southern Horsetooth Dent) is under investigation.—*Joseph S. Caldwell.*

5956. Shibata, Nagamichi. **Zur Frage der Fettzersetzung einiger Saprophyten. [On the question of fat decomposition by certain saprophytes.]** Jour. Biochem. Tokyo **1**: 249–260. 1922.—Ten saprophytic organisms, including *Bacillus prodigiosus, B. proteus vulgaris, B. pyocyaneus, B. coli communis, B. subtilis, B. mesentericus,* a staphylococcus, a streptococcus, a vibrio, and a yeast, each in pure culture, were tested as to their ability to decompose fat, 1st upon a medium containing horse flesh of known fat content, later upon a synthetic protein-free medium. The latter consisted of 5 gm. NaCl, 2 gm. K_2HPO_4, 6 gm. ammonium lactate, and 4 gm. asparagin per l. To 50 cc. of this solution 0.5 cc. of

neutral almond oil was added. Cultures were allowed to grow for 5, 15, 25, and 30 days at 30°C., and analyzed for fat content against sterile controls. The results indicate that *B. subtilis*, *B. pyocyaneus*, *B. mesentericus*, and the yeast accomplished the destruction of 1–2 per cent of the fat of the flesh and 2–5 per cent of the almond oil, but the results were rather irregular, being in one case 3 times as great in a 5-day as in a 30-day culture. The author concludes that the differences may be due to imperfect recovery of the unaltered fat from the cultures, and that the forms studied do not require fats for their development.—*Joseph S. Caldwell.*

5957. Terroine, Emile F., A. Feuerbach, et E. Brenckmann. **Unité de métabolisme énergétique et masse active des organismes.** [**The unity of the energy of metabolism and the active mass of the organism.**] Compt. Rend. Acad. Sci. Paris **176**: 462–464. 1923.—It has always been the dominant preoccupation of physiologists to determine the causes of the differences in the energy of metabolism of living things, and to find a unit of metabolism common to all. In 1882 it was recognized that the intensity of thermogenesis is governed by that of thermolysis, which in turn is a function of the cutaneous surfaces, and may be calculated by the law of surfaces. Recent studies tend to show that the conception of the law of surfaces is erroneous. Lapicque maintains that the law of surfaces cannot be explained by the requirements of heat. Voit points out a correspondence between the intensity of metabolism and the active mass of the organism consisting of albuminoid material. Moulton found that in cattle the correlation of nitrogen was not with weight of body but with the surface. Palladin, in the study of plant respiration, formulated in 1896 a law that the intensity of respiration is rigorously proportional to the indigestible nitrogen, that is, to the nucleinic nitrogen, thus showing the relationship of the nucleus to respiration.—*C. H. Farr.*

5958. Vergelot, Ch. **Application de méthode biochimique de Bourquelot a l'etude de quelques plantes de la famille des Caryophyllées et de celle des Papilionacées.** [**Application of Bourquelot's biochemical method to certain members of the Caryophyllaceae and Papilionaceae.**] Bull. Soc. Chim. Biol **3**: 513–519. 1921.—Aqueous extracts of entire fresh plants, previously plunged into boiling alcohol to destroy enzymes, were subjected to the action of invertase followed by emulsin, the optical rotation and the amount of reducing sugar being determined for each solution prior to the treatment and after the action of the enzymes. Data are given for 4 members of the Caryophyllaceae, *Saponaria officinalis* L., *Stellaria holostea* L., *Lychnis githago* Lam., *Lychnis dioica* DC.; and for 7 Papilionaceae, *Anthyllis vulneraria* L., *Genista sagittalis* L., *Ononis spinosa* L., *Ervum tetraspermum* L., *E. hirsutum* L., *Lotus corniculatus* L., and *Lathyrus pratensis* L. All contain a sugar hydrolyzable by invertase, but the application of Bourquelot's index of reduction indicates that in *Saponaria officinalis*, *Genista sagittalis*, *Ervum hirsutum*, *and Anthyllis vulneraria* this is some other sugar than saccharose. All except *Stellaria holostea* contain appreciable amounts of some substance hydrolyzable by emulsin and yielding reducing sugar, but no attempt to determine its nature was made.—*Joseph S. Caldwell.*

5959. Whittier, E. O. **The determination of mucic acid.** Jour. Amer. Chem. Soc. **45**: 1391–1397. 1923.

METABOLISM (NITROGEN RELATIONS)

5960. Fuente, Carlos Casada de la. **Über das Reserve-Eiweiss in den Zellen von Paeonia.** [**Reserve proteins in the cells of Paeonia.**] Beih. Bot. Centralbl. I Abt. **39**: 352–354. *Pl. 19.* 1923.—Cells of root, stem, leaf epidermis, floral leaves, stamens, and fruit are shown after treatment with different substances. Many plants contain protein in solution. *Paeonia albiflora* is especially favorable for the study of these proteins. Tests with caffein, methyl green, ammonia, etc., are described.—*L. Pace.*

5961. Hattori, Gisaburo, and Shigeru Komatsu. **The prolamin of Coix lacryma L.** Jour. Biochem. Tokyo **1**: 365–369. 1922.—The alcohol-soluble protein, called coicin by Yoshimura and Sagara, was prepared in pure form by extraction of the finely ground kernels with

80 per cent alcohol, precipitating the concentrated extract with water, and repeating the solution and precipitation 4 times. The analysis of this product gave the following percentages: glutamic acid, 20.65; leucin, 4.10; tyrosin, 1.46; arginin, 0.20; histidin, 1.88; and lysin, 0.76. The prolamin consequently resembles that of oats more closely than those of other grains.—*Joseph S. Caldwell.*

5962. Miyake, Koji, and S. Sōma. **Further studies of the nature of nitrification.** Jour. Biochem. Tokyo 1: 123–129. 1922.—K. Miyake has previously presented evidence (On the Nature of Ammonification and Nitrification. Soil Sci. 2: 481–492. 1916, and Further Studies of the Nature of Ammonification. Ibid. 4: 321–325. 1917) that the processes of ammonification and nitrification in soils are autocatalytic monomolecular reactions and that the increase of ammonia and nitric acid can be expressed by formulae. The present study reports results of experiments on nitrification of ammonium sulphate in air-dry soil kept at a moisture content equal to 6 per cent of its water-holding capacity in a 30°C. incubator. Nitric nitrogen and ammonia nitrogen were determined at 3-day intervals over a 35-day period. The results for increase of nitric acid agree closely with those calculated from the formula $\log x - \log (A - x) = K (t - t_1)$, in which x is the amount of nitrogen as nitric acid produced in the time t; A, the total amount produced in the process; and t_1, the time in which half the total amount is produced. The decrease of ammonia nitrogen is also expressed by the formula $\frac{\log (A - x)}{\log (x - a)} = (A - a) Kt - K$, in which x is the amount of nitrogen in the form of ammonia at the end of time t; A and a, the original and the final amount of ammonia; and K and K_1, constants. The process of diminution of ammonia compounds in soils is an autocatalytic chemical reaction.—*Joseph S. Caldwell.*

5963. Sasaki, Takaoki. **Über die Bildung der Anthranilsäure aus l-Tryptophan durch Subtilisbakterien. [Formation of anthranilic acid from l-tryptophan by Bacillus subtilis.]** Jour. Biochem. Tokyo 2: 251–254. 1923.—In earlier work [Sasaki, T., and I. Otsuka, Biochem. Zeitschr. 121: 167–170. 1921] it was found that *Bacillus proteus* could convert *l*-tryptophane into *l*-indol-lactic acid. Employing similar cultural methods with cultures of *Bacillus subtilis* allowed to grow for 40 days in a medium containing 2 gm. *l*-tryptophane, anthranilic acid, the optical antipode of indol-lactic acid, was formed in sufficient quantity (0.63 gm.) to permit of its identification by determinations of melting point and elementary composition. Its isolation from the end products was accomplished by distillation of the contents of the culture flask after adding alcohol, taking up the residue with water, acidifying the filtrate with phosphoric acid, shaking out with ether, separating the acid constituents from the ether extract by shaking out with $\frac{N}{2}$ NaOH, neutralizing with H_2SO_4, filtering with charcoal, and adding saturated $CuSO_4$ solution to the filtrate. The precipitate was washed with water, the copper removed with H_2S, and the solution extracted with ether in a Kumagawa-Suto extraction apparatus. Anthranilic acid crystallized out of the ether extract as it was evaporated down. The filtrate from the precipitate with $CuSO_4$ contained a trace of a substance precipitable by basic copper acetate, but the amount was too small to permit identification.—*Joseph S. Caldwell.*

5964. Yoshimura, Kiyohisa. **Beiträge zur Kenntnis der stickstoffhaltigen Bestandteile der Chayote (Hayato-uri). [The nitrogenous constituents of Chayote.]** Jour. Biochem. Tokyo 1: 347–351. 1922.—The fresh fruit of the Chayote (*Sechium edule*) contained 4.027 per cent of dry substance. The dry substance contained 2.602 per cent nitrogen, of which 59.99 per cent was protein nitrogen. 20 kgm. of fresh fruit yielded traces of adenin and cholin, 0.7 gm. arginin, and about 0.5 gm. guanidin.—*Joseph S. Caldwell.*

METABOLISM (ENZYMES, FERMENTATION)

5965. Aversenq, J. P., L. Jaloustre, et E. Maurin. **Sur quelques actions du thorium X sur les diastases et les microbes. [Certain effects of thorium X on diastase and microbes.]** Compt. Rend. Acad. Sci. Paris 176: 193–195. 1923.—A report is given of the effect of this material on the action of ptyalin, pancreatic amylase, amylase of germinating rice, emulsin,

ammoniacal fermentation, oxydase of the blood, oxidising ferments of saliva, and certain bacteria. In general it is found that thorium X activates these processes of hydrolysis and oxidation.—*C. H. Farr.*

5966. Bridel, Marc. **Action de l'emulsine des amandes sur le lactose en solution dans alcool ethylique a 85°. [Action of almond emulsin upon lactose in 85 per cent ethyl alcohol.]** Bull. Soc. Chim. Biol. 3: 533–538. 1921.—Emulsin was allowed to act for 25–70 days at room temperature, or at 40°C., upon a dilute solution of alcohol. The action ceased when 50 per cent of the lactose had been combined. B-ethylgalactoside and galactose were crystallized out of the products of the reaction and identified by their optical rotation and crystalline form. The lactose present in emulsin is therefore able to act in the presence of 85 per cent ethyl alcohol. The reaction is complex and it could not be determined, under the conditions of the experiment, whether lactose is first split into galactose and dextrose and these respectively combined with ethyl alcohol by galactosidase and glucosidase to form ethylgalactoside and b-ethylglucoside, or whether ethyllactoside is first formed and subsequently hydrolysed to form these 2 products.—*Joseph S. Caldwell.*

5967. Bridel, Marc. **Action de l'emulsine sur le galactose en solution dans des alcools propyliques de differents titres. [Action of emulsin upon galactose in solution in various concentrations of propyl alcohol.]** Bull. Soc. Chim. Biol. 3: 498–506. 1921.—Bourquelot and Hérissey established the fact that emulsin from almonds synthesizes b-propylgalactoside when allowed to act at room temperature upon an aqueous solution containing 1 per cent galactose and 20 per cent propyl alcohol. Bridel employed constant quantities of galactose and emulsin in varying concentrations of propyl alcohol, allowing the action to continue 113 days at 30°C., and found that there was little synthesis in the lower concentrations, the amount increasing with increase in concentration up to 45 per cent, where it was less than at 35, then increasing again up to 75 per cent. The enzyme rather rapidly loses its activity when kept in propyl alcohol of less than 45 per cent strength at 30°C., but maintains its activity in alcohol of higher concentrations. At ordinary temperatures activity is little affected whatever may be the strength of alcohol employed, but the synthesis goes on so slowly that the attainment of equilibrium may require months or years.—*Joseph S. Caldwell.*

5968. Goris, A., et P. Costy. **Sur l'urease des Champignons. [On the urease of fungi.]** Compt. Rend. Acad. Sci. Paris **176**: 412–414. 1923.—Urease, the hydrolysing ferment of urea, is obtainable from bacteria, fungi, and certain families of phanerogams, the legumes in particular. It is here studied from *Boletus edulis*. It is destroyed at 76°C., and has an optimum temperature of 30–38°C. A study is made of the effects of various inorganic and organic acids, also alkalies, neutral salts, and antiseptics.—*C. H. Farr.*

5969. Grazewska, Mme. Z. **L'action des diastases sur la Laminarine. [Action of enzyme upon laminarin.]** Bull. Soc. Chim. Biol. 3: 490–497. 1921.—The polysaccharid laminarin was obtained from *Laminaria flexicaulis* by repeatedly extracting the dried, pulverized material with boiling water, removing mucilaginous impurities with mercuric nitrate, filtering, removing mercury with H_2S, concentrating, and precipitating with alcohol. Aqueous solutions do not reduce Fehling's solution and are not precipitated by lead acetate or subacetate, though the latter precipitates in ammoniacal solution. Under certain conditions of temperature and concentration, aqueous solutions precipitate spontaneously. Hydrolysis for ½ hour at 120° with 5–6 per cent HCl yielded dextrose equalling 97.5–98.5 per cent of the laminarin used. Pancreatic juice and gastric juice of the dog, as well as a preparation of invertase made from the intestinal mucosa of the dog, and emulsin were without action upon laminarin. Vegetable amylase and invertase in slightly acid solution converted it into dextrose rather slowly, a mixture of equal parts of the 2 acting twice as rapidly as an equivalent amount of either separately. Taka-diastase was somewhat more active, and an extract of *Helix pomatia* still more so. No trace of maltose was found in the products of digestion.—*Joseph S. Caldwell.*

5970. Harter, L. L., and J. L. Weimer. **Amylase in the spores of Rhizopus Tritici and Rhizopus nigricans.** Amer. Jour. Bot. 10: 89–92. 1923.—An enzyme (amylase) capable of hydrolyzing potato starch paste is produced in the spores of these 2 species. Results indicate that the enzyme is produced in the spores regardless of the temperature at which they are grown, nor does the amount of enzyme seem to be correlated with the temperature to which the organism has been subjected. The enzyme produced by the mycelium has a higher hydrolyzing power than that in the spores.—*E. W. Sinnott.*

5971. McGuire, Grace, and K. George Falk. **Studies on enzyme action XXIII. The spontaneous increase in sucrase activity of banana extracts.** Jour. Amer. Chem. Soc. 45: 1539–1552. 1923.—During a study of banana sucrase, conditions arose where its action showed a spontaneous increase of considerable magnitude. The state of ripeness proved to be one factor. Also, this increase was more rapid at higher temperatures. The solutions used for the extraction were not a factor nor was the H-ion concentration a factor in increasing the hydrolysis.—*J. M. Brannon.*

5972. Mayeda, Minoru. **Preliminary communication on mannanase and laevidulinase.** Jour. Biochem. Tokyo 1: 131–137. 1922.—Cultures of 17 saprophytic bacteria were tested as to their ability to liquefy Konjak-mannan (prepared from *Amorphophallus Konjaku*, extensively used in the Japanese dietary). Four forms, *B. mesentericus vulgatus*, *B. mesentericus fuscus*, *B. mesentericus flavus*, and *B. leptosporus*, were able to liquefy mannan but no mannose was formed. The product of bacterial action is a trisaccharid which is hydrolyzed by mineral acids to mannose and glucose, and which the author names laevidulin. Fifteen species of fungi including *Penicillium glaucum*, *Verticillium glaucum*, *Monilia candida*, *M. javonica*, *Charla mycoderma*, and 10 species of *Aspergillus*, were tested as to their action upon Konjak. Nine of these—*Penicillium glaucum* and 8 species of *Aspergillus*—were able to liquefy mannan, but no mannose was formed. When cultures of these forms were dried, ground, and added to a medium containing either Konjak or laevidulin, mannose formation occurred, especially in the case of *Aspergillus niger* and *A. albus*. There are consequently 2 enzymes concerned in the process, a mannan-liquefying enzyme, mannanase, which forms laevidulin, and an enzyme which splits laevidulin to mannose, for which the name laevidulinase is proposed. Of various commercial diastase preparations examined, "digestin" and "endiastase," both made from plant materials, contain both enzymes, while diastases of animal origin do not contain laevidulin. The mannan-liquefying enzyme diffuses through a collodion capsule, laevidulinase does not.—*Joseph S. Caldwell.*

5973. Miyake, Koji, and Mitsuji Ito. **On lethal temperature of Koji-diastase in aquatic solution and the recovery of its action after heating.** Jour. Biochem. Tokyo 2: 255–270. 1923.—An aqueous extract of Koji (polished rice infected by *Aspergillus Oryzae*) containing 1.0115 per cent solids was used. Portions of this were heated for various periods up to 120 minutes at temperatures from 25 to 145°C. and were then tested for power to saccharify soluble starch, the digestion continued 100 hours at 38°C. under toluene. The amount of sugar formed was determined after 1, 5, 15, 25, 50, and 100 hours. Heating to 40°C. for 2 hours, or to 55, 70, 85, or 100°C. for periods ranging from a few seconds to 1 hour decreased but did not wholly prevent diastatic activity. The diminution in activity became greater with increase in temperature, and in the case of any particular temperature it was roughly proportional to the time the heating was continued. A solution heated to 115°C. for 15 minutes or less retained some saccharifying power, but was inert when the time of heating was 30–60 minutes; one heated to 130 or 137.5°C. for "an instant" still showed traces of activity but was inert if the heating was continued 5 minutes or more. Even momentary heating to 140°C. or higher completely destroyed activity. The degree of injury is consequently a function of temperature and time of heating. In the study of recovery of activity after heating, various portions of the solution were heated to differing temperatures for various time intervals, cooled, and kept under toluene at room temperature for periods of 25–480 hours prior to testing. The activity of each of these was checked against a portion of the solution heated to the same temperature for the same time

immediately before the test. In every case in which the temperature and time of heating were insufficient to wholly destroy diastatic activity, the activity gradually increased after the solution had been allowed to stand in an amount proportional to the time allowed to elapse, but the recovery was in every case very imperfect. If the temperature and time of heating were such as to totally destroy activity, there was no recovery. Whether recovery is due to the formation of new enzyme from a mother substance present in the extract or to a true recovery of diastatic action after temporary loss cannot be definitely determined from these experiments, though the authors favor the assumption that it is a true recovery.—*Joseph S. Caldwell.*

5974. Thomas, Arthur W., and F. L. Seymour-Jones. **The hydrolysis of collagen by trypsin.** Jour. Amer. Chem. Soc. **45**: 1515–1522. 1923.—It is commonly stated that trypsin does not attack collagen unless it has been pre-treated with acids or alkalies, or shrunk in water at 70°C., or treated with pepsin. The authors found that trypsin attacked collagen. The optimum reaction is pH 5.9. A pre-treatment with acid does not affect the tryptic digestion. The rate of hydrolysis increases with a decrease in the size of the collagen particles and an increase in the concentration of the enzyme.—*J. M. Brannon.*

METABOLISM (RESPIRATION, AERATION)

5975. Christiansen, M. **En simpel methode til Dyrkning af anaerobe Bakterier under Pyrogallol.** [**A simple method for growing anaerobes under pyrogallol.**] K. Vet. og. Landbohoejskoles Aarsskr. **1923**: 52–61. *Fig. 1–2.* 1923.—Common agar or bouillon tubes, or even culture media in 250 cc. flasks, are boiled, then the cotton plugs are flamed and pushed a little downwards in the tubes. Absorbent cotton wet with pyrogallol is placed in a short tube connected with the culture tube by means of a rubber tube 25 mm. long. When the tubes are without rims the application is easy if the rubber tubing is wetted. By this method the culture glass is kept free from pyrogallol, the tube may be opened, and the pyrogallol may be renewed. —*Ernst Gram.*

5976. Maquenne, L. **A propos d'une Communication récente de MM. P. A. Dangeard et Pierre Dangeard.** [**Concerning a communication of Messrs P. A. and Pierre Dangeard.**] Compt. Rend. Acad. Sci. Paris **176**: 205–207. 1923.—This paper contains a statement of appreciation of the contribution made by the authors named in their paper [see Bot. Absts. 12, Entry 5922]. The physiological significance of the discovery is discussed. It is pointed out that it is possible only if the respiratory quotient is at least equal to 1. It is stated that the relationship between photosynthesis and respiration in this connection is yet to be studied.—*C. H. Farr.*

5977. Popoff, Methodi. **Sur le système respiratoire des plantes.** [**The respiratory system of plants.**] Compt. Rend. Acad. Sci. Paris **176**: 594–596. 1923.—It is generally recognized that the leaf is well adapted for respiration, since the diffusion of oxygen may take place from the external air and also from the intercellular spaces as a result of the process of photosynthesis. The mechanism affording aeration of the stem and roots, especially of trees, seems to be quite insufficient. The difficulty, however, disappears, if it is admitted that plants have a respiratory system analogous physiologically to that of animals. The salts of Mg, Mn, K, Ca, and Fe are found in the blood serum of animals, even of the invertebrates which have no blood corpuscles or haemoglobin. These same minerals circulate in the vessels of plants. The roots of plants take in $MgSO_4$, KCl, KNO_3, NaCl, $CaSO_4$, $CaH_4(PO_4)_2$, $Fe_3(PO_4)_2$, etc., in solution. The oxygen absorbed in this solution is transported to the roots, trunk, and branches of the plant. This circulation is assured by the incessant transpiration of the leaves. In turn the water of the stream is charged with CO_2 from the cells which take up the oxygen. This CO_2 is carried to the leaves and discharged or used in photosynthesis. In the leaves the water is again charged with oxygen and descends in the tubes of the phloem. The ascending and descending currents are connected by the medullary rays which correspond to the capillaries of animals.—*C. H. Farr.*

ORGANISM AS A WHOLE

5978. Amar, Jules. **La loi du minimum en Biologie.** [The law of the minimum in biology.] Compt. Rend. Acad. Sci. Paris 176: 466–468. 1923.

5979. Garner, W. W., and H. A. Allard. **Further studies in photoperiodism, the response of the plant to relative length of day and night.** Jour. Agric. Res. 23: 871–920. *Pl. 1–19.* 1923. —Trials with many kinds of plants, in addition to those previously studied [see Bot. Absts. 5, Entry 22], demonstrate the importance of the seasonal range of length of day as a factor in initiating and regulating both sexual and asexual reproduction in plants. Observations are reported on length of day as a factor in the character and extent of branching, in root growth, in pigment formation, in abscission and leaf fall, in dormancy, and in rejuvenescence. Apogeotropic growth—increase in stature as affected by the daily light period—is given detailed consideration in its apparent relation to flowering, fruiting, and the other responses mentioned.—From the more general aspects of the problem it appears that the degree of hydration of the living cell is subject to very delicate regulation by change in the ratio of the number of hours of light to the number of hours of darkness. Regardless of its actual causative significance, hydration is subject to definite regulation by length of day, and change in the degree of hydration is definitely correlated with change in form of expression in the plant.—*D. Reddick.*

5980. Jordan, Edwin O., and J. C. Geiger. **Two "food poisoning" outbreaks apparently due to bacilli of the paratyphoid enteritidis group.** Jour. Infect. Diseases 32: 471–478. 1923. —Poisoning, supposedly from contaminated food, was believed to have been caused by *B. paratyphosus A* in one instance and *B. paratyphosus B* in another. Previous inoculation with vaccine containing the typhoid bacillus and strains of paratyphoid bacilli failed to confer any protection on the individuals.—*R. L. Starkey.*

5981. Santolyne, P. **Les cultures pures de ferments sélectionés pour améliorer les qualités du beurre et des fromages.** [Pure cultures of selected ferments for improving the quality of butter and cheese.] Nat. Canadien 49: 61–63. 1922.—This is a popular introduction to the scientific developments of today.—*A. H. MacKay.*

5982. Scheunert, A., und M. Schieblich. **Ueber die bei der elektrischen Futterkonservierung ablaufenden Vorgänge.** [The sequence of events during the electrical treatment of fodder.] Illus. Landw. Zeitg. 43: 57–58. 1923.—The effects on the bacterial flora are discussed. By raising the temperature the electric current causes an increase in the number of desirable species of bacteria, notably the lactic acid-producing forms, and a decrease in the undesirable species. The final result is a fodder which is practically sterile. A list of bacteria is given including the relative numbers of these at different stages in the treatment, likewise a list which is considered an "obligate Konservierungsflora."—*John W. Roberts.*

5983. Yamagata, U., and J. K. Wilson. **Reaction of medium and growth of Azotobacter.** [Abstract.] Absts. Bact. 7: 85. 1923.

GROWTH, DEVELOPMENT, REPRODUCTION

5984. Cremieu, V. **La croissance de végétaux et les principes de la physique.** [The growth of plants in relation to physical principles.] Compt. Rend. Acad. Sci. Paris 176: 263–265. 1923.—This paper is a consideration of the work done in growth, in the lifting of the plant against gravity. It is calculated that 125 kgm. of oat seed planted on a hectare of ground, lift during their development into mature plants 1500 kgm. of seed and 3000 kgm. of straw to a height of 0.6 m. It is held that the growth of the stem is due to an action characteristic of the interior of the initial cells and independent of the weight of the cells. This action is discontinuous and is directed by the resultant of the field which controls the interior of the cell, without distinguishing between the field of gravity and the field of inertia. It is calculated

that the work done by a young stem of corn or onion per second is about 0.03 erg. The emission of segments of the meristem is compared to the emission of alpha rays from a radioactive atom, and it is said to correspond to a certain value of the turgescence of the cell.—*C. H. Farr.*

5985. Hunter, C., and E. M. Rich. **Laboratory note. An apparatus for the measurement of stem elongation.** New Phytol. 22: 44–47. *2 fig.* 1923.—By the use of the spherometer with an electrical recording device, growth increments of 0.005 mm. were measured. The method is applicable to *Impatiens* and similar plants in which a leaf axil close to the growing point may be used to support the vertical glass tube employed in the apparatus.—*I. F. Lewis.*

5986. Priestley, J. H., and J. Ewing. **Physiological studies in plant anatomy. VI. Etiolation.** New Phytol. 22: 30–44. 1923.—If the environments of root and stem are reversed experimentally, little structural modification is seen in the root, but in the stem the great structural modifications known as etiolation appear. Of the various types of etiolation known, the common one shown by *Vicia Faba* and the potato are here considered. Under conditions normal to the root, the stem apex resembles in its development the root. The apical meristem remains relatively impermeable to nutrient sap. Meristematic tissue active in growth is found below the persistent "plumular hook." The rudiments of the lateral leaves and axillary branches therefore fail to develop further. Another consequence of the changed meristematic development is the production of a functional primary endodermis in the stem. To the presence of this endodermis may be attributed in part the reduced cortical development of the stem. Owing to the depression of transpiration extension goes on in an etiolated plant equally by day and night. The experiments cited do not support the hypothesis that elongated growth in etiolation is due to the absence of a growth inhibiting secretion formed by the chloroplasts in the light.—*I. F. Lewis.*

5987. Priestley, J. H., and Lettice M. Woffenden. **Physiological studies in plant anatomy. V. Causal factors in cork formation.** New Phytol. 21: 252–268. 1922.—Experiments with *Begonia* show "that periderm formation involves two processes, first a suberization which seals the injured surface, secondly a meristem formation which follows upon the accumulation of sap at the injured surface." The effect of sap pressure in the formation of meristem is shown by the behavior of cut leaves of *Prunus Laurocerasus* and *Camellia japonica* when supplied with water under a pressure of about 10 cm. of mercury. In this case meristem formed around the cut in less than 2 weeks, while in similar leaves standing in water there was no meristem formation. The preliminary suberization that usually blocks a parenchymatous surface prior to the formation of phellogen is shown to depend primarily upon air. These considerations apply not only to wound cork formation, but also to the scar left at leaf fall and to natural cork formation. They also serve to explain certain "special cases, such as the general absence of periderm formation in the cortex of roots, in the axes of aquatic plants, and in leptosporangiate ferns."—*I. F. Lewis.*

5988. Reed, Ernest. **Hypothesis of formative stuffs as applied to Bryophyllum calycinum.** Bot. Gaz. 75: 113–142. *Fig. 1–10.* 1923.—A summary of previous work on growth correlation is given. The author presents a series of 10 experiments, 2 of which will be given here. An experiment yielding evidence against the "inhibiting factor" theory is as follows: A leaf removed from the plant and thereby cut off from the influence of any inhibiting force, when placed in an upright position in moist sand, did not in 6 months produce any plantlets from the notches. In another experiment portions of several leaves were placed in contact with moist sand, and those notches which were in contact with the substratum were the ones which produced plantlets, no evidence being found to substantiate Loeb's theory of an "available formative stuff" as the controlling factor. From all of his experiments the author deduces the following: "The growth of the foliar shoots in *B. calycinum* is possible only from the performed buds in the notches of the leaf. When these Bryophyllum plants are growing under normal conditions the buds in the leaves lie dormant. There are no indications that this dormancy is due to the fact that these units are deprived of formative stuffs or specific substances, the avail-

ability of which would cause their germination. The plant or any organ of the plant does not exert an inhibiting influence over these meristematic units. The dormancy or the germination of these units is an expression of the metabolic condition of the organ of which they are a part. The germination of these units is probably due to physical and chemical changes within the organ of which they are a part. Any factor or group of factors working together which set up this series of changes are indirectly responsible for the growth of the foliar plantlets or those from the axillary buds. One of the conditions which starts the growth from the meristematic units of the leaf is very moist air or water in contact with the leaf. The absence of light also brings about a condition which starts this growth."—*B. W. Wells.*

5989. Reed, H. S. **A note on the statics [statistics] of cyclic growth.** Proc. Nation. Acad. Sci. [U. S.] 9: 65–67. *1 fig.* 1923.—During their 1st season's growth, 79 apricot branches reached a mean length of 235.95 cm. and produced lateral shoots averaging 37 in number and about 7 times the length of the main branch in total length. The lateral shoots were typically produced in 3 groups, in which number and size of lateral decreased distally along the main axis. The numerical relations were closely approximated by 3 overlapping curves derived from the differential equation of growth, $Z = dy/dx = ky\ (A - y)$. It is concluded that the length of each lateral and the size of each group is a function of position on the main branch, and that the decreasing size of cycles suggests clamped oscillations.—*Howard B. Frost.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

5990. Cholodnyj, N. **Über den Einfluss der Metallionen auf den Geotropismus der Wurzeln. [The influence of metals on the geotropism of roots.]** Beih. Bot. Centralbl. I Abt. 39: 239–256. 1923.—The experiments show that the ions of alkali metals and alkaline earths influence considerably the bendings of roots. It is highly probable that these ions play an important part in the mechanism of the geotropic reaction.—*L. Pace.*

5991. Saxton, W. T. **Autonomous movements in Eleiotis sororia DC.** Jour. Indian Bot. 3: 72–78. *2 fig.* 1922.—The lateral leaflets of *Eleiotis sororia*, a plant of northern Bombay Presidency, exhibit movements similar to those of *Desmodium gyrans*. The tip of a leaflet describes an "ellipse," the long axis of which is an arc of about 140°. The period of revolution is about 2 minutes. Synchronously with its other movements the leaflet rotates about 45° on its own axis. Movement parallel to the petiole and rotation of the leaflet on its own axis are brought about by the distal end of the petiolule, while rotational movement about the petiole is due to curvature at the proximal end of the petiolule.—*Winfield Dudgeon.*

5992. Saxton, W. T. **Some observations and suggestions regarding "nyctinasty."** Jour. Indian Bot. 3: 127–142. *1 pl.* 1923.—The author describes observations on "sleep" movements of 31 plants (4 Euphorbiaceae, 23 Leguminosae, *Abutilon indicum* Sweet, *Triumfetta rhomboidea* Jacq., *Thespesia populnea* Soland, and *Achyranthes aspera* L.), all but 1 of which are found abundantly at Ahmedabad, India. Characteristic "sleep" positions of the leaves are described and figured. Most of them are referable to one or another of Kerner's 3 types. In a few plants the movements from day to night position and back are described in detail. In the majority of cases folding and unfolding require about 40–45 minutes each for completion, and are carried out while the sun is up.—After dismissing earlier theories, which seem to assume that the expanded or day position is the normal one, the author proposes the theory that "the night and not the day position is that 'normal' to plants, and that therefore there is no such thing as 'nyctinasty.' The movement so-called is merely the return of the plant to its normal position after the stimulus is withdrawn which keeps it during the day in another position, regarded here as one of physiological strain. Those plants in which such movements are not seen either have a normal position suited to their daylight requirements, or have not sufficient 'elasticity' to return to the normal position after once departing from it." —*Winfield Dudgeon.*

GERMINATION, RENEWAL OF ACTIVITY

5993. Blomquist, H. L. **Dormancy in seed of persimmon (Diospyros virginiana).** Jour. Elisha Mitchell Sci. Soc. 38: 14. 1922.—The seed have normally a resting period not definitely determined, but apparently lasting from 2 to several years. This was found to be due mainly to a layer of the seed covering which caps the radicle and decreases water absorption. When this cap was removed, 100 per cent germination was secured.—*W. C. Coker.*

5994. Brandts, P. **De kieming der zaden.** [Germination of seed.] Natuurw. Tijdschr. 4: 233–234. 1922.—"Germination" is usually considered as the emergence of the tip of the root. The writer, however, takes the view that germination takes place when the 1st new divisions occur in the formative region of the root.—*J. C. Th. Uphof.*

5995. Harrington, George T. **Use of alternating temperatures in the germination of seeds.** Jour. Agric. Res. 23: 295–332. *20 fig.* 1923.—Seeds of carrot (*Daucus carota*), parsley (*Petroselinum hortense*), timothy (*Phleum pratense*), awnless brome grass (*Bromus inermis*), *Lolium perenne, L. multiflorum, Festuca elatior, Impatiens balsamina, Eschscholzia calfiornica, Iberis amara, Cosmos bipinnatus, Kochia scoparia, Delphinium ajacis, Calendula officinalis, Reseda odorata, Tropaeolum majus, T. inermis, Viola tricolor, Petunia hybrida, Dianthus chinensis, Papaver* spp., *Portulaca grandiflora splendens, Antirrhinum majus, Lathyrus odoratus,* and *Zinnia elegans* germinate nearly or quite as rapidly and completely at favorable constant temperatures as with any alteration of temperatures.—Seeds of *Agrostis palustris, Dactylis glomerata, Poa pratensis, Capriola dactylon, Pastinaca sativa, Celeri graveolens,* and *Holcus halepensis* require an alteration of temperatures for best germination.—A study of temperature changes in incubators leads to the conclusion that for testing seeds that require alternation of temperatures it is better to use 2 incubators and move the seeds than to depend upon changing the temperature in a single incubator.—*D. Reddick.*

5996. Mutterlein. **Kartoffel-Keimversuche. [Experiments in the sprouting of potatoes.]** Illus. Landw. Zeitg. 43: 102–103. 1923.—Experiments are given demonstrating the effects of darkness, temperature, moisture, and cutting on the sprouting of potato tubers.—*John W. Roberts.*

5997. Sempers, J. Ford. **Vitality of canna seeds.** Amer. Bot. 29: 57–60. 1923.—A few observations were made on the durability of seed coats, especially those of canna.—*S. P. Nichols.*

TEMPERATURE RELATIONS

5998. Burke, Georgina S. **Studies on the thermal death time of spores of Clostridium botulinum. 2. The differential staining of living and dead spores.** Jour. Infect. Diseases 32: 433–438. *Fig. 1.* 1923.—Heat increased the permeability of spores of *Clostridium botulinum* to carbol-fuchsin; dead spores stained solid while living spores did not. The amount of heat necessary to bring about the change in permeability varied with the individual spores. The differential penetration of the dye into living and dead spores suggested a rapid method of determining their proportional abundance in cultures.—*R. L. Starkey.*

TOXIC AGENTS

5999. Cholodnyj, N. **Zur Frage über die Beeinflussung des Protoplasmas durch mono- und bivalente Metallionen. [The influence of mono- and bivalent metal ions on protoplasm.]** Beih. Bot. Centralbl. Abt. 39: 231–238. 1923.—The root hairs of *Trianea bogotensis* were used because of their large size and rich plasma content and the movement of the cytoplasm. KCl, $CaCl_2$, $BaCl_2$, NaCl, $MgSO_4$, LiCl, and $MnCl_2$ were used.—The author concludes that the ions of all alkali metals possess a more or less positive toxicity which is evident in changes in the consistency of the protoplasm, in the slowing and even complete stopping of plasma movement with, finally, the death of the protoplasm. The toxicity of these substances is not identical.

K and NH_4 salts are more toxic than Na salts. The ions of the alkaline earths and of other bivalent metals are also poisonous, with the possible exception of Ca. But they furnish a more or less evident protection against injury from the monovalent ions of metals.—*L. Pace.*

6000. Janke, Alexander. **Die Bekämpfung der Kahm Organismen und ihre Bedeutung für die Konservenindustrie. [The control of the zooglea-forming organisms and their relation to the canning industry.]** Centralbl. Bakt. II Abt. 56: 1–7. 1922.—The use of allyl-mustard oil proved very effective in controlling the zooglea-forming organisms, which are very often destructive to acid preserves such as tomatoes, sour kraut, etc.—*Anthony Berg.*

6001. Kusonoki, Michio. **On the bactericidal action of hydrosol of silver.** Jour. Biochem. Tokyo 1: 381–388. 1922.—*Bacillus coli communis* was employed as the test organism. The dialysates obtained by dialyzing silver sols against distilled water in contact with air or O_2 had high bactericidal power which was abolished by addition of traces of NaCl, thus indicating that the silver ion is the active agent. Dialysates made in an atmosphere of H_2 or CO_2 had practically no bactericidal properties. The author considers that in O_2 or air the silver hydrosol oxidizes to silver oxide, which dissociates, giving the silver ion as the active agent. In the air, silver carbonate, which dissociates more easily than the oxide, is formed by reaction with CO_2. Bactericidal activity is almost independent of the concentration of the colloidal silver hydrosol provided that there is free access of air, so as to permit the setting free of the silver ion.—*Joseph S. Caldwell.*

6002. Mori, Gensichi. **A preliminary note on the inhibitory action of the salts of silver and some other heavy metals on amylase.** Jour. Biochem. Tokyo 2: 117–129. 1922.—Silver as the nitrate, chloride, and bromide, gold chloride as sodium chloraurate, copper sulphate, and lead acetate were studied as to their inhibitory effect upon formation of maltose from soluble starch by malt diastase. The results do not agree with the conclusion of U. Olsson (Hoppe-Seyler's Zeitschr. Physiol. Chem. 114: 51–71. 1921) that the decrease of amylolytic activity is directly proportional to the amount of silver salt added. Working with concentrations of 6×10^{-8} mol or less, the inhibitory action is a constant function of the concentration of the metal; with higher concentrations there is no agreement. The results indicate that there may be a well defined relation between concentration of enzyme and concentration of salt. When the amount of added silver salt is large, the action of the enzyme is directly proportional to the square of the amount of enzyme solution in cc. and inversely proportional to the square of the amount of salt solution in cc. An equation is developed to represent the relation between the concentration of enzyme and metal and the degree of inhibition which agrees fairly well for the experimental data presented for the metals studied. This equation is based upon the assumption that metals depress enzymic activity by formation of a definite metal-enzyme compound. The fact that the activity of a diastase preparation inactivated by $AgNO_3$ can be restored by addition of H_2S is regarded as bearing out this assumption. The strengths of inhibitory action of silver, gold, copper, and lead stand in the ratio of $1 : \frac{1}{18} : \frac{1}{30} : \frac{1}{1400}$.—*Joseph S. Caldwell.*

6003. Nicolas, E., et G. Nicolas. **L'influence de l'hexamethylenetetramine et de l'aldehyde formique sur la morphologie interne et sur le chimisme du haricot. [The influence of hexamethylenetetramine and of formaldehyde on the internal structure and chemical composition of beans.]** Compt. Rend. Acad. Sci. Paris 176: 404–407. 1923.—Recently the authors have shown [see Bot. Absts. 12, Entries 4595, 4596] that hexamethylenetetramine and formaldehyde added in small amounts to Knop's nutrient media are used as food by beans. The present study is undertaken to find whether these substances have an anatomical effect. A concentration of 0.01–0.025 per cent of hexamethylenetetramine clearly favors the development of secondary wood, which is more abundant and more lignified, as indicated by treatment with phloroglucine, in the treated than in the control. Cells of the pericycle are more differentiated, with walls thicker than in controls. A concentration of 0.05 per cent which is still not toxic, also increases the development of wood and the differentiation of the pericycle, but not to so

marked a degree as in the lower concentrations. A higher concentration induces an abundant growth of epidermal hairs. The lower concentrations favor the deposition of starch in the stem at the periphery of the pith, while a concentration of 0.0321 per cent facilitates the deposition of starch in the root. It is concluded that these results favor the formaldehyde theory of photosynthesis.—*C. H. Farr.*

6004. Villedieu, G., et Mme. [G. Villedieu]. **Action des oxydes insolubles sur le mildiou de la pomme de terre (Phytophthora infestans). [The effect of insoluble oxides on Phytophthora infestans.]** Compt. Rend. Acad. Sci. Paris **176**: 534–536. 1923.—It has previously been shown by the authors [see Bot. Absts. 9, Entry 529] that *Penicillium* and *Mucor* are prevented from growing by certain substances, such as the oxides of copper and cadmium, which are practically insoluble. It is now undertaken to study the germination of the conidia of *Phytophthora infestans* in the same way. Drop cultures were observed continuously under the microscope. The solution was prepared by leaving an excess of the oxide in doubly distilled water for 24 hours, and then filtering. Three types of cultures were employed: in 1 this filtrate was used; in the 2nd there was added to the filtrate a little of the solid oxide; and in the 3rd a long drop was made in 1 end of which some of the solid oxide was placed. Conidia were sown throughout each drop. In the 1st case the conidia form active zoospores, which in turn germinate. In the 2nd nothing developed, or, if a zoospore did escape, it immediately died without germinating. In the last case the zoospores were formed and developed normally in the end of the drop in which there was no precipitate, but in the end in which the oxide was placed, nothing remained alive. The oxides used were red oxide of mercury, black oxide of copper, zinc oxide, cobalt oxide, cadmium oxide, and magnesium oxide—which becomes the hydrate in water. It is concluded that the toxicity is due to the basic nature of the oxides, for if the oxides are neutralized with acids the mildew develops. It also develops in solutions of Bi_2O_3, Fe_2O_3 Al_2O_3, Cr_2O_3, Pb_3O_4, MnO_2.—*C. H. Farr.*

MISCELLANEOUS

6005. Brambila, Miguel. **Estudio fisico-quimico del aceite de chicalote. [Physical and chemical studies of the oil of the Mexican poppy.]** Rev. Agric. [Mexico] **7**: 236–238. *2 fig.* 1922.—Methods of refining the oil from the seed of the Mexican poppy (*Argemone mexicana*) are given together with the physical and chemical properties of the oil.—*John A. Stevenson.*

6006. Scheunert. **Zur Frage der Verwendung der Kohlensäure bei der Grünfutter-Konservierung. [The use of CO_2 in the preservation of green fodder.]** Illus. Landw. Zeitg. **42**: 229–230. 1922.—In experiments conducted by the writer, CO_2 failed to prevent spoilage of green fodder.—*John W. Roberts.*

6007. Troland, L. T. **The present status of visual science.** Bull. Nation. [U. S.] Res. Council **5**: part 2, No. 27. *120 p.* December, 1922.—The object of this monograph is neither to present new data nor to summarize old work, but rather to analyze the aims, methods, and general nature of the phenomena of vision from the points of view of physics, physiology, and psychology. Practically every phase of vision is covered, ranging from the nature of light, through the dioptric and retinal mechanisms, to the perception of time and space in the visual field. A good bibliography is appended giving a chosen set of leading articles and books, from which the reader may begin the study of any portion of this enormous field.—*Selig Hecht.*

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 5297, 5298, 5301, 5304, 5306, 5312, 5313, 5319, 5331, 5341, 5342, 5343, 5345, 5346, 5347, 5348, 5351, 5352, 5359, 5361, 5366, 5375, 5378, 5410, 5455, 5475, 5478, 5542, 5643, 5709, 5801, 5803, 5841, 5921, 5930, 5935, 5938, 5962, 5983)

6008. Anonymous. **Weeds steal soil moisture.** Associated Grower **5**[5]: 7. 1923.—The author quotes Thomas F. Hunt's statement concerning the work of F. J. Veihmeyer and A. H. Hendrickson on soil moisture conservation in California. Their experiments show that

no significant saving of moisture results from cultivation of the soil, provided all weed growth is kept down by surface hoeing. Cultivation on the farm is essential, however, as the only practical means of controlling weed growth. The experiments in California are confirmed by field experiments in Kansas.—*E. L. Overholser.*

6009. Chardón, Carlos E. **Estudio preliminar sobre la amonificación y nitrificación de los terrenos de Puerto Rico.** [Preliminary studies on the ammonification and nitrification in Porto Rican soils.] Rev. Agric. Puerto Rico 6[1]: 37–46. 1921.—The author, from a series of laboratory experiments, concludes that the addition of lime to the typical heavy red soil of Porto Rico is desirable since it aids in nitrification. This holds true whether or not organic nitrogenous fertilizers are applied.—*John A. Stevenson.*

6010. Christensen, H. R. **Den kemiske Jordbundsanalyse.** [Chemical soil analysis.] Ugeskr. Landm. 67: 393–396. 1923.—This is a review of a lecture by K. A. Vesterberg printed in Internat. Mitt. Bodenkunde for 1922.—Attempts to determine nutritive materials for plants by chemical analysis of the soils have hitherto been unsuccessful. Determinations of the minimum concentrations of phosphoric acid, nitrogen, and potassium required for normal plant development may be helpful. Investigations of drainage water and lysimeter experiments show that these concentrations, in mg. per l. of soil moisture are: 1–2 of P_2O_5, 2–5 of N, and 10–20 of K_2O. When the amounts of these elements required by the different crops are determined, the power of the soil to produce and maintain the necessary concentrations during the growing season should be investigated.—*Ernst Gram.*

6011. Christensen, H. R. **Havrens Forhold til Jordens Kalkindhold.** [The relation of oats to the lime content of the soil.] Ugeskr. Landm. 68: 81–82. 1923.—In Danish field experiments increasing amounts of lime increased the crop of oats, even up to an application of 48 tons of calcium carbonate per hectare, and to pH 7.2–7.5. If heavy applications of lime sometimes injure oats on certain heavy clays, the effect is indirect and of unknown nature.—*Ernst Gram.*

6012. Christensen, H. R. **Humleagtig Sneglebælgs Forhold til Jordens Surhedsgrad.** [Relation of Medicago lupulina to soil acidity.] Vort Landbrug 42: 30. 1923.—The investigations of C. Olsen corroborate those of S. Joffe, according to which alfalfa may thrive at pH values considerably lower than 7. Even with a pH value of 5, an acidity seldom found in mineral soils in Denmark, some growth occurs, while an approximately maximal growth is reached at about pH 6.—*Ernst Gram.*

6013. Christensen, H. R. **Humleagtig Sneglebælgs Forhold til Jordreaktionen.** [The relation of Medicago lupulina to soil reaction.] Ugeskr. Landm. 67: 612–614. 1922.—An investigation of 30 soil samples from 9 farms has shown that while the pH as a rule is high where black medic is vigorous, it may thrive well on soils where the pH goes down as far as 6.1 or even 5.8. The average pH of fields with a good crop was 6.7. Apparently the poor spots in the black medic fields are not always due to lack of lime.—*Ernst Gram.*

6014. Fraps, G. S. **The fixation of phosphoric acid by the soil.** Texas Agric. Exp. Sta. Bull. 304. *22 p.* 1922.—Higher temperatures increase fixation in some Texas soils, as did prolonged contact. Acid treatment which removed the lime carbonate had little effect on fixation in some soils and decreased it considerably in others. Igniting the soil increased its power to fix phosphoric acid even when the lime was previously removed by acid. A large part of the fixation took place below the mixture of soil and fertilizer. An examination of 761 surface soils and 651 subsoils showed that the percentages of iron and aluminium increase with the increase in the percentages of phosphoric acid fixed.—*L. Pace.*

6015. Godbole, S. V. **Some criticisms on Mason's method of determining directly the physiological humidity of the soil.** Jour. Indian Bot. Soc. 3: 174–177. 1923.—Mason's method [West Indian Bull. 19: March, 1922] consists in using the points of hard-leaded pencils ("Kohi-

noor" GII) to absorb water from the soil for a definite period of time, and taking the weight of absorbed moisture as an index of the water-supplying power of the soil. The author finds the method unsatisfactory for the following reasons: (1) different pencils and different parts of the same pencil do not have the same absorbing power; (2) water is absorbed through the varnished sides as well as through the wood exposed at the point; (3) some moisture is lost before weighing unless great precaution is taken; (4) some soil adheres to the point; (5) air-dry pencils contain some moisture; and (6) the absorbing surface is too small.—*Winfield Dudgeon.*

6016. Greenstreet, V. R. **Report on the soils of Lubok Tamang and Cameron's Highlands.** Malayan Agric. Jour. **10:** 281–283. *Sketch map.* 1922.—These soils are of uniformly open texture with adequate content of organic matter and nitrogen; they show striking resemblance to the best tea and Cinchona soils of India and Java respectively and are suitable for market garden purposes. [See also Bot. Absts. 12, Entry 5464.]—*R. E. Holttum.*

6017. Greenstreet, V. R. **The composition of Kedah and Perlis phosphates.** Malayan Agric. Jour. **11:** 70–71. 1923.—These phosphates show great variation, and though a fairly high percentage of phosphorus may be present, in all samples but 1 (Perlis) the amount of iron and aluminium was so much in excess of the calcium as to make the phosphorus "unavailable."—*R. E. Holttum.*

6018. Greve, M. **Om Forholdet mellem Jordens Reaktion og Udviklingen af Humleagtig Sneglebælg.** [**On the relation between soil reaction and the development of Medicago lupulina.**] Ugeskr. Landm. **67:** 618–619. 1922.—An investigation of 8 localities shows that black medic may be very vigorous with a pH of 6.2 or 6.5. Surplus of water or lack of certain plant foods as well as lack of lime may inhibit its growth.—*Ernst Gram.*

6019. Harrison, W. H. **Report of the Imperial agricultural chemist.** Sci. Rept. Agric. Res. Inst. Pusa **1921–22:** 24–33. *1 pl.* 1922.—Recommended methods of chemical analysis of manures, fertilizers, and soils have been collated and prepared for publication. An accurate method for the estimation of soil carbonates has been devised. The Pusa method of phosphoric acid determination is found more suited to Indian conditions than either the American 1919 or Prescott's methods.—Experiments with the windrowing of sugar cane continued. " * * * the length of time windrowed canes can be stored is determined by the incidence of heavy rains."—There is uniformly a higher percentage of CO_2 in the soil atmosphere of a grassed plot than of a cultivated plot. Excess of CO_2 is most marked in the monsoon, when high temperature and heavy rainfall favor decomposition of organic detritus from grass roots. During the dry season the moisture content of the soil of grassed plots falls as low as 1 per cent, whereas in cultivated plots it is 5.5 per cent. "Similar differences in the value of the nitric nitrogen are also found."—Movements of nitrates in the soil and sub-soil have been studied. "The investigation, so far as it has progressed, shows that the distribution of nitrates through the sub-soil is determined by climatic factors and the physical characters of the sub-soil layers, and that the growth of the crop is in turn controlled to a considerable extent by this distribution."—A list of publications for the year concludes the report.—*Winfield Dudgeon.*

6020. Hasselbalch, K. A. **Kulturplanternes forskellige Krav til Jordens Reaktion, III Rødkløver.** [**The different requirements of cultivated plants as to soil reaction, III Trifolium pratense.**] Ugeskr. Landm. **68:** 121–123. 1923.—Not the soils but the crops require lime, and they require it to a different degree. R. Christensen has indicated that oats, rye, and potatoes require less lime than do barley or clover, while alfalfa may fail on ground good for clover. This range may also be expressed in pH values, for which the author has proposed the term "Reaktionstal," i.e., reaction figure. But while soils where the relation between lime and acid is 1:2 or 10:20 have practically the same pH, they will need very different amounts of lime to raise the pH from 5 to 7. Preliminary investigations seem to indicate

that for each crop a minimum pH may be found, which must be determined only on fields where all other factors are favorable. For *Trifolium pratense* the minimum is found at 6.0–6.3 and the most copious growth occurs at 6.5 and above.—*Ernst Gram.*

6021. Hasselbalch, K. A. **Om Trivslen af Humleagtig Sneglebælg som Maalestok for Agerjordens Kalktrang. [The vigor of Medicago lupulina as on indicator for the lime requirement of cultivated soils.]** Ugeskr. Landm. 67: 577–579. 1922.—On the author's farm black medic has been grown in 2 cases previous to liming, the lime being withheld in those parts of the field where the medic was vigorous. Where black medic grows well the pH was 7.4 (the average of 10 locations), and in poor spots with weak plants whose leaves were yellowish green and which had few nodules, 6.8. The medic will not thrive well where the pH is below 7.0, whereas plants like wheat and barley may thrive on more acid soils. [See also Bot. Absts. 12, Entries 6012, 6013, 6018, 6025, 6028.]—*Ernst Gram.*

6022. Hoffmann, R. **Stickstoff Düngungsversuche auf Grünland. [Experiments on nitrogen-fertilization of meadow lands.]** Landw. Jahrb. 58: 567–600. 1923.—Using the formulae of Mitscherlich, the author found that the yield of hay, as a result of fertilization with ammonium sulphate, can be expressed by the formula, $\log (A - Y) = \log A - 0.025 (x + z)$. The factor C (=0.025) was independent of the maximum yield (A) and, therefore, also independent of all growth factors, such as climate, soil, kind of plant, etc. The value z, which indicates what part of the soil-nitrogen equivalent to ammonium sulphate is available, depends upon the soil used. Potassium phosphate fertilization had, in most cases, no appreciable effect. Nitrogen fertilization had a marked stimulating effect upon the growth of the grass, especially the timothy, the clover being almost completely repressed.—*S. A. Waksman.*

6023. Keen, B. A. **Rothamsted and the schools. Determinations of soil moisture at the end of the great drought.** School Sci. Rev. [London] 3: 60–62. 1921.—The cooperation of schools with Rothamsted has given reliable data on the degree to which various depths of soil lose water during droughts, and on the moisture content of bare cultivated soil and that carrying vegetation.—*Elsie Hammond.*

6024. Kilbinger, A. **Eine einfache und sichere Methode zur Bestimmung des Säuregrades und des Kalkbedarfs der Ackerböden. [A simple and reliable method for determining the degree of acidity and calcium requirements of cultivated soils.]** Illus. Landw. Zeitg. 43: 44. 1923.—The measurement of acidity is obtained by the color changes from rose to deep red resulting when a given amount of soil is mixed with a solution of "Rhodan" potassium. By the same method slightly modified, it may be determined whether a non-acid soil is neutral or alkaline and, if alkaline, the degree of alkalinity.—*John W. Roberts.*

6025. Madsen, M. **Om Betydningen af Jordens Brintionconcentration ved Dyrkning af visse kalkelskende Kulturplanter. [The importance of soil acidity for the growing of certain lime-requiring crops.]** Vort Landbrug 41: 562–564. 1922.—From an investigation of 39 samples of soils from alfalfa and black medic fields, it is concluded that for both crops, on both light and heavy soils, the pH required to secure a good growth is about 7.0 or higher.—*Ernst Gram.*

6026. Mitscherlich, E. A., F. Dühring, S. V. Saucken, und C. Böhm. **Die pflanzenphysiologische Lösung der chemischen Bodenanalyze. [The plant physiological solution of chemical soil analysis.]** Landw. Jahrb. 58: 601–617. 1923.—As a result of a series of pot experiments with soil and various mixtures of soil and sand in an attempt to solve the chemical analysis of soil by plant physiological means, the authors came to the following conclusions: The value of nitrogen as a nutrient is constant for various soils, as well as for sand, and also for various plants; this furnishes a plant physiological basis for nitrogen as a nutrient

in chemical soil analysis; in other words, vegetative experiments permit determination of the quantities of nitrogen present in a given quantity of soil in a form available to plants.—*S. A. Waksman.*

6027. Němec, Antonin, et Kvapil Karel. **Étude biochimique des sols forestiers. [Biochemical study of forest soils.]** Compt. Rend. Acad. Sci. Paris **176**: 260–262. 1923.—The authors report a study of the acidity of soil and the catalase activity of humus and mineral soils from forests of different kinds of trees.—*C. H. Farr.*

6028. Olsen, C. **Humleagtig Sneglebælgs Forhold til Jordens Surhedsgrad (Brintion-concentration). [The relation of Medicago lupulina to soil acidity, pH.]** Vort Landbrug **42**: 16–19. *1 fig.* 1923.—In jar experiments with a highly acid (pH = 4.0) sandy soil, rich in humus, from a raspberry formation in a forest, calcium carbonate was added so as to obtain the following pH values in the jars: 4.0, 5.1, 6.9, 7.4. When the resulting crop was weighed green the following respective weights were found as an average of 3 jars: 26, 106, 179, and 153 gm. The acidity of the soil was almost unchanged at the close of the experiment.—*Ernst Gram.*

6029. Schönbrunn, Bruno. **Über den zeitlichen Verlauf der Nitrifikation, unter besonderer Berücksichtigung der Frage nach dem periodischen Einflusz der Jahreszeit. [The temporal course of nitrification with special reference to the question of the periodic influence of the seasons.]** Centralbl. Bakt. II Abt. **56**: 545–546. 1922.—A series of soil cultures kept under different conditions were analyzed at regular intervals to determine the progress of ammonification and nitrification. Some of the cultures were kept at constant temperatures, one of the objects being to determine whether the rhythmic cycle of nitrification as it exists in nature is due entirely to the external factors of climatic variations, or whether the organisms having passed through this cycle for centuries have adapted themselves to follow a certain rhythmic course of activity independent of external factors. The results indicate that temperature is the principal factor influencing ammonification and nitrification, and that the periodic influence of the seasons, independent of climatic conditions, is negligible.—*Anthony Berg.*

6030. Sewell, M. C. **Effect of Andropogon sorghum on succeeding crops of Triticum sativum vulgare.** Bot. Gaz. **75**: 1–26. *Fig. 1–11.* 1923.—The author states that 5 possible causes of the harmfulness of kafir have been suggested: depletion of minerals, toxic root excretions, toxic products of decay, diseases associated with the crop, and the effect of soil protozoa and microorganisms. The author's experiments indicate that the most important of these is the "toxic decomposition products of the crop residue." Field data, covering 6 years, show the yield of winter wheat when grown after kafir to be 3 bushels less to the acre than when grown after corn. In the greenhouse, wheat growth in kafir soil was uniformly depressed. When grown in soil watered by (1) corn soil leachings, (2) aerated kafir soil leachings, and (3) non-aerated kafir soil leachings, only the 1st showed depression. Oxidation evidently destroys the toxin. In pot cultures, where wheat was watered with non-aerated leachings from trays containing growing kafir and corn, the leachings from kafir definitely inhibited the development of the wheat. The author also presents data showing that while the kafir crop removes more fertilizing elements from the soil than corn, this is not a factor in depressing the wheat yield. He also finds that the growth of kafir does not affect the ability of the soil to liberate nitrogen.—*B. W. Wells.*

6031. Skinner, J. J., and F. E. Allison. **Influence of fertilizers containing borax on the growth and fruiting of cotton.** Jour. Agric. Res. **23**: 433–443. *Pl. 1–4.* 1923.—Anhydrous borax was mixed with fertilizers and applied at the rate of 5, 10, and 20 pounds to the acre. On most soil types as little as 5 pounds to the acre injured young cotton plants. When the borax was broadcasted instead of drilled in the rows the injury was not so pronounced and

abundant rainfall also lessened the amount of injury. Borax drilled in the row at the rate of 100 pounds to the acre, or broadcasted at the rate of 200 pounds, entirely prevented germination.—*D. Reddick.*

6032. Walton, J. H. **Report of the Imperial agricultural bacteriologist.** Sci. Rept. Agric. Res. Inst. Pusa **1920–21:** 28–33. 1921.—Nitrogen losses from cattle dung stored under aerobic and anaerobic conditions were found to be relatively small, while urine lost 85 per cent under aerobic and only 15 per cent under anaerobic conditions. In a highly calcareous soil, as that of Pusa, solubilization of phosphate was found to take place upon composting with green manure. Fresh *Bassia latifolia* cake at first lowered the nitrate nitrogen in the soil to zero, but after 4 weeks nitrogen again began to appear, in no case, however, exceeding the percentage originally present in the soil. After composting the cake with Trichi rock phosphate or rock phosphate and sulphur for 4 weeks, 25 per cent of the nitrogen became nitrifiable, and in 1 case 45 per cent.—Promising results in the manufacture of indigo have just been obtained by sterilizing the water with "E.C." (a product developed and made at Pusa) for 12 hours before adding a pure culture of indican hydrolyzer. "The first day's working gave produce of the remarkably high quality of 78.5 per cent, which is probably the highest ever obtained in Bihar." "E.C." has proved effective also in sterilizing wells, in treatment of septic wounds, and for surgical dressings in hospitals.—Yeasts have been isolated and their fermentative power studied, and bacterial rots of potato and onion are under investigation. A program of work for 1921–22 and a list of publications for the year are appended.—*Winfield Dudgeon.*

6033. Westermann, T. **Undersøgelser over Fordampning fra ubevokset og bevokset Jord. [Investigations of evaporation from bare and planted soil.]** K. Vet. og Landbohoejskoles Aarsskr. **1922:** 1–55. *4 fig.* 1922.—A system of tanks permitted study under varying atmospheric conditions, in different soils, with different water levels, cultivation, and crops. In summer the evaporation from bare sandy soil varied from 37.7 to 117.5 per cent of the natural precipitation, while for clayey soil the corresponding values were 50.5–132.8. The Papilionaceae have a high evaporating capacity, the small grains rank lower, and potato and mangold lowest of the plants investigated. In the same species the total leaf area of 2 varieties, and also the differences in growth, produced by increasing amounts of fertilizer, exert a distinct influence on the evaporation.—*Ernst Gram.*

6034. Yamandi, Juan G. **Composition del suelo y su preparación. [Composition of the soil and its preparation.]** Rev. Soc. Rural Córdoba [Argentina] **21:** 6007–6026. 1922.—The author describes the various soil types and gives their physical characteristics. Soil water and its circulation in the soil are discussed as well as the manner in which plants utilize the moisture. The penetration of air and heat into the soil is necessary for seed germination, plant growth, and the development of soil organisms. The time and methods of working the soils of Argentina for best results are discussed.—*John A. Stevenson.*

6035. Zyl, C. E. Van der. **De huidige stand der mechanische grondbewerking op Java. [The present condition of mechanical cultivation of the soil in Java.]** Mededeel. Proefst. Java Suikerindust. **1922:** 155–193. 1922.—The use of mechanical plows in Java is compared with hand labor. Best results were obtained on light sandy soil. On heavy soil mechanical plowing and cultivation is practical only in large fields.—*Peter J. Klaphaak.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*
E. B. Payson, *Assistant Editor*

(See also in this issue Entries 5392, 5442, 5465, 5474, 5480, 5738, 5748)

GENERAL

6036. Cook, O. F. **Are any species uniform?** Jour. Heredity 12: 285–287. 1922.—The author states his thesis in the following paragraph: "Species are maintained by processes of sexual reproduction, with continual crossing of the individual lines of descent, so that each species forms a network of lines of descent. The question of uniformity bears on the nature of the specific network. Are there reasons for believing that the members of the same species are uniform, identical, or homozygous? Or should we think of the members of species as normally diverse, with multifarious germinal constitutions represented among the different individuals and lines of descent that are woven together?"—It is pointed out that the existence of uniform species is a taxonomic ideal that has never been realized, and that unless evidence can be brought forward to prove the existence of such species the idea may as well be abandoned as interfering with clear thinking on the processes of evolution.—*R. C. Cook.*

6037. [Druce, G. C.] [Rev. of: Prain, David, Editor. **Index Kewensis. Vols. I–V, Suppl. 1–5.** 1885–1921 (see Bot. Absts. 11, Entry 3199).] Rept. Bot. Soc. and Exchange Club British Isles 6: 342–347. 1921 [1922].—[See also Bot. Absts. 11, Entry 3189.]

6038. Fritsch, Karl. **Ist Cardamine bulbifera als Abkömmling ein Bastardes aufzufassen?** [Is Cardamine bulbifera to be considered of hybrid origin?] Ber. Deutsch. Bot. Ges. 40: 193–196. 1922.—The author disagrees with Ernst, who considered *Cardamine bulbifera* as a hybrid. Its greater distribution than that of its supposed parents, the fact that *C. bulbifera* is not an intermediate form, and the presence of bulbils do not suggest to the author that this species is a hybrid.—*W. C. Muenscher.*

6039. Козо-Полянского, Б. М. [Kozot-Poljanski, B. M.] **Введение В Филогеническую Систематику Высших Растений.** [An introduction to the phylogenetic system of vascular plants.] *v + 167 p., 6 pl.* Природаи Культура [Nature and Culture]. Woronesh, 1922.—An outline of some lectures.—*B. M. Kozot-Poljanski.*

6040. Pellett, F. C. **What is cow-itch?** Amer. Bee Jour. 62: 466. *Fig. 1–3.* 1922.—The common name cow-itch should be restricted to *Cissus incisa.* But in the South [U. S. A.] the trumpet creeper (*Tecoma radicans*) and other climbing vines are sometimes given this vernacular name.—*J. H. Lovell.*

6041. Robinson, B. L. **The need of monographic activity in American botanical taxonomy.** Science 57: 307–311. 1923.

PTERIDOPHYTES

6042. Anonymous. **Current topics and events.** Nature 111: 93. 1923.—This article notes that a special exhibit of epiphytic species of *Platycerium* and some of *Polypodium* has been arranged in the tropical Fern House at Kew, and gives brief descriptions of the habits of several species.—*O. A. Stevens.*

6043. Alderwerelt van Rosenburgh, C. R. W. K. van. **New or interesting Malayan Ferns.** Bull. Jard. Bot. Buitenzorg III, 2: 129–186. *Fig. a–h.* 1920.—The author presents an annotated list of Malayan pteridophytes which contains the following new species, varieties, names, and combinations: *Alsophila heteromorpha* var. *decomposita, A. persquamulifera* (v. A. v. R.), *Angiopteris monstruosa, Aspidium papyraceum, Asplenium bicarinatum, A.*

fibrilliferum, Athyrium macrocarpum var. *decompositum, A. nigripes* var. *Clarkei* (Bedd.), *Cyathea magnifolia, C. Loctersii, C. binnangensis, C. Ramosiana, C. amphicosmioides, C. densisora, Cyclophorus brevipes, C. elaphoglossoides, Davallia subdissecta* var. *subgenuina, Diplazium mesocarpum, D. betimusense, Dryopteris paraphysophora, D. Mannii* (Hope), *D. microcarpa, D. tabacifera, D. pterospora, D. echinospora, D. perglandulifera* var. *firmior, D. verruculosa* var. *sumatrana, D. subfalcinella, D. stipellata* var. *obtusata, D. submollis, Hemitelia montana, H. fallax* var. *major, H. paraphysophora, Histiopteris conspicua, Humata lanuginosa, H. squarrosa, Lecanopteris carnosa* var. *pumila, Lindsaya repens* var. *pseudohemiptera, Lomagramma sumatrana, L. pteroides* var. *negrosensis* (Copel.) and var. *subcoriacea* (Copel.), *Loxogramma prominens, L. vittariifolia, Mesochlaena sumatrensis, Phegopteris lastreoides, P. fallax, P. rubicunda, Plagiogyria subrigida, Pleocnemia stenosemioides, Pleopeltis subnormalis, P. parvifrons, P. dendroconchoides, P. congregatifolia, P. murkeleana, P. contigens, P. Treubii* var. *Brooksii, Polypodium ceramicum, P. mutatum, P. Yoderi* var. *denudatum, P. revolvens, Polystichum prolificans, P. puncticulatum, Pteris appendiculifera, P. aberrans, Syngramma luzonica, Tapeinidium sumatranum, Trichomanes minimum, T. paniculatum* var. *minus, Lycopodium patentissimum, L. pinifolium* var. *lanceolatum, Selaginella simalurana, S. consobrina, S. sunaquatilis, S. congregata, S. flabelliformis, S. balica, S. xerophila, S. fimbriata* var. *grandifolia, S. heteromorpha, S. rubicundipes, S. herpocaulos* var. *acuminata, S. Wallichii* var. *deliana.*—*Alfred Rehder.*

6044. Maxon, Wm. R. **A new Salvinia from Trinidad.** Jour. Washington [D. C.] Acad. Sci. **12**: 400–401. 1922.—*Salvinia cyathiformis* is described.—*Helen M. Gilkey.*

6045. Maxon, Wm. R. **The genus Culcita.** Jour. Washington [D. C.] Acad. Sci. **12**: 454–460. 1922.—The writer considers *Balantium* of the family Cyatheaceae a technical synonym of *Dicksonia*, and advises the substitution of *Culcita* for *Balantium* as known today, since this is an equivalent of the *Balantium* of present writers. Eight species are described 1 of these, *C. blepharodes*, being new.—*Helen M. Gilkey.*

SPERMATOPHYTES

6046. Alderwerelt van Rosenburgh, C. R. W. K. van. **New or noteworthy Malayan Araceae.** Bull. Jard. Bot. Buitenzorg **III, 1**: 359–389. 1919.—The author presents descriptions of, and notes on, Malayan Araceae preceded by an artificial key to the genera. The following species and combinations are new: *Amorphophallus subcymbiformis, A. Lorzingii, A. Brooksii, A. Decus silvae, A. timorensis, A. Hewittii, A. paucisectus, A. discophorus, Anadendron microstachyum* (De Vries & Miq.), *A. malaianum* (Miq.), *A. superans, Cyrtosperma syapense, C. cuspidispathum, C. subulispathum, C. hastatum, C. consobrinum, Epipremnum ceramense* (Engl. & Krause) and var. *flavispathum, E. papuanum, E. silvaticum, E. mampuanum, Lasia concinna, Pothos longivaginatus, P. Jacobsonii, P. Englerianus, P. peninsularis, P. brevivaginatus, Raphidophora crassifolia* (Engl.), *R. celatocaulis* (N. E. Br.), *R. apiculata, R. conocephala, R. talamauana, R. Hallieri, R. pilosula, Scindapsus mamilliferus, S. javanicus.* —*Alfred Rehder.*

6047. Almquist, Ernst. **Bursa pastoris Weber.** Rept. Bot. Soc. and Exchange Club British Isles **6**: 179–207. *9 fig.* 1920 [1921].—G. C. Druce in the Introduction (pp. 179–190) shows that *Bursa* has priority over *Capsella.* He also gives a history of its segregates. Almquist gives descriptions of 18 species.—*G. C. Druce.*

6048. Ames, Oakes. **A discussion of Pogonia and its allies in the Northeastern United States.** Orchidaceae **7**: 3–38. *Pl. 102–108.* 1922.—A key is given to 5 genera, namely, *Pogonia, Cleistes, Isotria, Triphora,* and *Psilochilus.* New names are: *Triphora gentianoides* Ames & Schltr. (*Arethusa gentianoides* Sw.) and *Cleistes divaricata* Ames (*Arethusa divaricata* Linn.).—*E. D. Merrill.*

6049. Ames, Oakes. **A new Oncidium from Haiti.** Orchidaceae 7: 159–160. 1922.—*Oncidium haitiense* Leonard & Ames is described as new.—*E. D. Merrill.*

6050. Ames, Oakes. **A triandrous form of Psilochilus macrophyllus.** Orchidaceae 7: 45–48. *Pl. 110.* 1922.—A new name, *Psilochilus macrophyllus* (Lindl.) Ames, is published, based on *Pogonia macrophylla* Lindl.—*E. D. Merrill.*

6051. Ames, Oakes. **Additions to the orchid flora of the mountain province, Luzon.** Orchidaceae 7: 141–155. 1922.—The following new species are described: *Acoridium linearifolium, A. perplexum, A. pulcherrimum, A. unicorne, Bulbophyllum alboroseum, B. invisum, B. papillipetalum, Ceratostylis dataensis, Eria carnicolor, Habenaria boadanensis,* and *H. reticulata.*—*J. M. Greenman.*

6052. Ames, Oakes. **New or noteworthy orchids from different parts of the world.** Orchidaceae 7: 83–140. *Pl. 114.* 1922.—The following new species are proposed: *Bulbophyllum cubicum* (Philippines), *B. erratum* (Philippines), *B. nigroscapum* (Samoa), *Campylocentrum panamense* (Panama), *Coelogyne longirachis* (Philippines), *C. Ramosii* (Philippines), *Dendrobium appendiculoides, D. candoonense, D. sinuosum,* and *Dendrochilum prodigiosum* (Philippines), *Epidendrum sulcatum* (Colombia), *Eria candoonensis, E. hirsutipetala, E. macera, E. microchila, E. propinqua,* and *E. vagans* (Philippines), *Liparis magnicallosa, L. prava,* and *L. propinqua* (Philippines), *Malaxis bracteosa* (Philippines), *Notylia panamensis* (Panama), *Oberonia linearifolia* (Borneo), *O. lipensis* and *O. minutissimà* (Philippines), *Pleurothallis consimilis* (Trinidad), *P. Hitchcockii* (British Guiana), *P. Schaferi* (Cuba), *P. Williamsii* (Panama), *Plocoglottis McGregorii* (Philippines), *Robinquetia Merrillii* Ames (*Malleola Merrillii* Ames), *R. Ramosii* (Philippines), *Sarcochilus tripercus* (Philippines), *Spiranthes bicaudata* (Trinidad), *S. Wrightii* nom. nov. (*Spiranthes monophylla* Cogn. p.p., Cuba), *Stelis parvibracteata* (Panama), *S. pleurothalloides* (Colombia), *S. Williamsii* (Panama), *Thrixspermum Weberi* (Philippines), and *Trichoglottis brachiata* (Philippines). Critical notes are given on a number of older species proposed by various authors.—*E. D. Merrill.*

6053. Ames, Oakes. **Nomenclatorial changes in Dendrochilum.** Orchidaceae 7: 79–82. 1922.—A new genus, **Pseudacoridium,** with *P. Woodianum* Ames, based on *Dendrochilum Woodianum* Ames from the Philippines, is described, and the following new names in *Acoridium* appear, based on Philippine species of *Dendrochilum: Acoridium affine, A. anfractoides, A. auriculare, A. binuangense, A. cinnabarinum, A. confusum, A. Curranii, A. Elmeri, A. exile, A. Foxworthyi, A. hastatum, A. Hutchinsonii, A. irigense, A. Loheri, A. longibulbum, A. lucbanense, A. luzonense, A. maleolens, A. McGregorii, A. microchilum, A. mindorense, A. pulogense, A. pumilum, A. purpureum, A. quadrilobum, A. reniforme, A simulacrum, A. Vanoverberghii,* and *A. Wenzelii.*—*E. D. Merrill.*

6054. Ames, Oakes. **Notes on Erythrodes with nomenclatorial changes and descriptions of three new species.** Orchidaceae 7: 63–78. 1922.—The new species are *Erythrodes chicharrasensis* Ames and *E. mexicana* Ames from Chiapas, Mexico, and *E. trinitatis* Ames from Trinidad. The generic name *Erythrodes* Blume, having priority over *Physurus* L. C. Rich. is adopted and the following new names appear, transfers from *Physurus: Erythrodes aratanhensis, E. arietina, E. argyrosticta, E. bicolor, E. bifalcis, E. brachyrhyncha, E. calophylla, E. caucana, E. clavigera, E. commelinoides, E. debilis, E. densiflora, E. dolichostachya, E. erythrodoides, E. foliosa, E. hetaerioides, E. hyphaematica, E. humilis, E. juruenensis, E. lacteola, E. Lehmannii, E. Lindleyana, E. loxoglottis, E. lunifera, E. maculata, E. major, E. Mayoriana, E. metallescens, E. minor, E. mystacina, E. nigrescens, E. ovata, E. paleacea, E. pauciflora, E. Petersiana, E. Pittieri, E. procera, E. rariflora, E. repens, E. rosea, E. stenocentron, E. stictophylla, E. tridax, E. Tuerckheimii, E. vaginata, E. valida, E. vescifera, E. xystophylla,* and *E. zeuxinoides.*—*E. D. Merrill.*

6055. Ames, Oakes. **Notes on Mexican species of Triphora.** Orchidaceae 7: 39–44. *Pl. 109.* 1922.—*Triphora yucatanensis* Ames is described and figured as new, and notes on, and a figure of, *T. mexicana* Schltr. are given.—*E. D. Merrill.*

6056. Ames, Oakes. **Studies of Otostylis brachycalyx and the species with which it has been confused.** Orchidaceae 7: 49–62. *Pl. 111–113.* 1922.—*Cyrtopodium Broadwayi* Ames from Trinidad is figured and described as new. *Otostylis brachycalyx* Schltr. and *Cyrtopodium cristatum* Lindl. are figured and discussed.—*E. D. Merrill.*

6057. Ames, Oakes. **Two new species of Malaxis from Haiti.** Orchidaceae 7: 156–158. 1922.—*Malaxis domingensis* and *M. Leonardii* are described as new; while the following new combinations are made: *Malaxis carpinterae* (*Microstylis carpinterae* Schltr.), and *M. Adolphii* (*Microstylis Adolphii* Schltr.).—*E. D. Merrill.*

6058. Backer, C. A. **Contributiones ad cognitionem florae Indiae Batavae. [Contributions to the knowledge of the flora of Dutch East India.]** Bull. Jard. Bot. Buitenzorg III, 2: 315–330. 1920.—The paper contains a note on *Heliconia indica* Lam.; a description of the new Melastomataceous genus **Triuranthera,** with the 1 species *T. Bakhuizenii;* and descriptions of the following new species, varieties, and combinations: *Aristolochia coadunata* var. *Bosschai, A. tripartita, Bauhinia viridiflora, Crotalaria Valetonii, Diplachne polystachya* (Forsk.), *D. tectoneticola, Gentiana singgalangensis, Mapania Heyneana,* and *Sonneratia ovata.*—*Alfred Rehder.*

6059. Blake, S. F. **New composites from Salvador.** Jour. Washington [D. C.] Acad. Sci. 13: 143–146. 1923.—*Vernonia Standleyi, Rensonia salvadorica,* and *Zexmenia iners* are described as new species, with **Rensonia** as a new genus.—*Helen M. Gilkey.*

6060. Blake, S. F. **New South American Asteraceae collected by E. W. D. Holway.** Bot. Gaz. 74: 414–430. *Pl. 19.* 1922.—Material from Ecuador and Bolivia is dealt with here. The following species are described: *Achyrocline glandulosa, A. hyperchlora, Polymnia eurylepis,* **Monopholis** gen. nov., *M. hexantha, M. Holwayae, Wedelia Holwayi, W. isolepis, Helianthus hypargyreus, Perymenium ecuadoricum, Steiractinia Rosei, Verbesina adenobasis, V. latisquama, Calea huigrensis, Gynoxys hypomalaca, Mutisia sagittifolia, Hieracium pazense.*—*B. W. Wells.*

6061. Blake, S. F. **Three new composites from Bolivia.** Proc. Biol. Soc. Washington 36: 51–54. 1923.—*Erigeron senecioformis, Aspilia lucidula,* and *Calea rhombifolia* are described as new.—*J. C. Gilman.*

6062. Blake, S. F. **Two new genera related to Narvalina.** Jour. Washington [D. C.] Acad. Sci. 13: 102–105. *Fig. 1.* 1923.—The writer proposes **Cyathomone** and (in collaboration with Earl E. Sherff) **Ericentrodea,** both genera being based principally upon achene characters. *Ericentrodea* includes the plants originally described under *Narvalina corazonensis* Hieron., *N. homogama* Hieron., and *Bidens mirabilis* Sherff; while the single representative of *Cyathomone* was formerly described under the name *Narvalina Sodiroi* Hieron.—*Helen M. Gilkey.*

6063. Britton, C. E. **British Centaureas of the Nigra group.** Rept. Bot. Soc. and Exchange Club British Isles 6: 406–417. 1921 [1922].—*C. surrejana* and *C. Drucei* are described as new and 4 new varieties are noted.—*G. C. Druce.*

6064. Britton, N. L., and J. N. Rose. **The two species of deerhorn cactus.** Jour. Washington [D. C.] Acad. Sci. 12: 328–330. *Fig. 1–2.* 1922.—To the formerly monotypic genus *Peniocereus,* has been added a second species, *P. Johnstonii,* collected by Ivan M. Johnston in the islands of the Gulf of California. A description of the new species and a key are included.—*Helen M. Gilkey.*

6065. Britton, N. L., and Paul C. Standley. **Three new plants of the family Rubiaceae from Trinidad.** Jour. Washington [D. C.] Acad. Sci. 13: 105–107. 1923.—*Evea tontaneoides*, *Urceolaria clusiaefolia*, and *U. angustifolia* are described.—*Helen M. Gilkey.*

6066. Camus, E. G., et A. Camus. **Iconographie des Orchidées d'Europe et du Bassin Méditerranéen.** [Illustrations of orchids of Europe and of the Mediterranean Basin.] *4 to 72 p.; folio 122 pl.* Paul Lechevalier: Paris, 1921.—This work, as the title indicates, is primarily a collection of illustrations of orchids. Descriptions, synonymy, and bibliography are omitted, except for the new varieties, forms, and hybrids. The authors, however, give full explanations of the plates of which 110 are in color and depict the habit of the entire plant as well as detailed characters of the flowers. The remaining 12 plates are uncolored and illustrate the anatomy of various species. The new varieties, forms, and hybrids included are: *Serapias Lingua* L. f. *nana* G. Cam., × *S. Lamarberguei* f. *laxiflora* G. Cam., × *S. meridionalis* G. Cam. var. *lutescens* G. & A. Cam., ×× *Orchiserapias complicata* var. *latiloba* G. Cam., ×× *O. complicata* var. *angustiloba* G. Cam., ×× *O. Fontanae* G. Cam., Berg. & A. Cam. var. *trisecta* G. & A. Cam., *Loroglossum hircinum* Rich. var. *immaculatum* G. & A. Cam., *Orchis papilionacea* L. var. *minima* G. Cam., *O. latifolia* L. var. *Barlae* G. Cam., *O. maculata* L. var. *brachystachys* A. Cam., × *O. Cortesii* G. & A. Cam. = *O. longicornu* × *Morio* G. & A. Cam., × *O. Braunii* Halacsy var. *alpina* A. Cam. = *O. latifolia* × *maculata* var. *brachystachys* A. Cam., ×× *Orchigymnadenia Heinzeliana* G. Cam. var. *gracilis* A. Cam. = *Gymnadenia conopea* × *O. maculata* var. *brachystachys* A. Cam., *Ophrys Scolopax* Cav. f. *viridiflora* A. Cam., *O. apifera* subsp. *Olympiadae* Ougrinski, × *O. Cortesii* A. Cam.= *O. atrata* × *litigiosa* A. Cam.—*J. M. Greenman.*

6067. Cohen Stuart, C. P. **A basis for tea selection.** Bull. Jard. Bot. Buitenzorg III, 1: 193–320. *Pl. 21–31.* 1919.—The paper is an enlarged English translation of the botanical part of the author's Dutch thesis on tea selection published in 1916; it is divided into 2 parts, an historical and geographical, and a systematic part. In the 1st, the author deals with the historical development of the cultivation of the tea plant in Java, British India, and China and with its origin and geographical distribution. In the 2nd, he gives first his reasons for uniting *Camellia* and *Thea* under the name *Camellia*, and a key to the known species of the genus; in another chapter, the varieties of the Tea plant, *Camellia theifera*, are discussed; and the last chapter deals with 4 critical species. An enumeration of the herbarium specimens examined and a bibliography conclude the paper. One species, *Camellia Henryana*, and the following combinations are new: *C. hozanensis* (Hay.), *C. Nakaii* (Hay.) and *C. furfuracea* (Merr.).—*Alfred Rehder.*

6068. Harms, H. **Ueber Luetzelburgia, eine neue Gattung der Leguminosen aus Brazilien.** [Luetzelburgia, a new genus of Leguminosae from Brazil.] Ber. Deutsch. Bot. Ges. 40: 177–180. *Fig. 1.* 1922.—A new genus, **Luetzelburgia,** is based upon and described from flowering material collected by Ph. von Luetzelburg. This genus is placed in *Sophoreae* but it suggests a connecting link between *Sophoreae* and the higher *Papilionate.* A single species, *L. pterocarpoides*, is described.—*W. C. Muenscher.*

6069. Jumelle, Henri. **Le groupe du Chrysalidocarpus lutescens.** [The group of Chrysalidocarpus lutescens.] Compt. Rend. Acad. Sci. Paris 174: 1674–1677. 1922.—This species is a palm of Madagascar. It is separated with difficulty from other species of the same genus, several of which are discussed in this paper.—*C. H. Farr.*

6070. Killip, E. P. **Three new species of Passiflora from Venezuela and Ecuador.** Jour. Washington [D. C.] Acad. Sci. 12: 330–332. 1922.—*Passiflora* (*Granadilla*) *dispar*, *P.* (*Granadilla*) *perlobata*, and *P.* (*Granadilla*) *Popenovii* are described.—*Helen M. Gilkey.*

6071. Koorders, S. H. **Beitrag zur Kenntniss der Flora von Java, no. 10, 11 und 15–20.** [Contribution to the knowledge of the flora of Java, No. 10, 11 and 15–20.] Bull. Jard. Bot. Buitenzorg III, 1: 136–189. *Pl. 7–19.* 1919.—This paper consists of separate articles con-

taining notes on various Javanese plants and descriptions of new species. It is preceded by an index to Nos. 1–20 of these contributions giving the title and place of publication of the numbers not contained in the present paper. The contents of the present numbers are as follows: No. 10, *pl. 7, 8:* description of *Elaeocarpus littoralis* Teijsm. & Binn.; No. 11, *pl. 9:* description of *Glochidion palustre* n. sp.; No. 12, *pl. 10:* note on *Clethra javanica* Turcz.; No. 15: description of *Coix palustris* n. sp.; No. 16: note on *Cyrtosperma Merkusii* Schott; No. 17, *pl. 11–13:* description of *Alocasia bantamensis* n. sp., and note on the juvenile form of *Cassia javanica* L.; No. 18, *pl. 14, 15:* description of *Kalanchoe Schumacheri* n. sp., and revision of the Crassulaceae of Java; No. 19, *pl. 16, 17:* description of *Pentapanax elegans* n. sp., with var. *pubescens;* No. 20, *pl. 18, 19:* description of *Zingiber Vanlithianum* n. sp.—*Alfred Rehder.*

6072. Koorders, S. H. **Beschreibung einer von Dr. Ouwehand im Toba-See, in Sumatra, entdeckten neuen Art von Coix.** [Description of a new species of Coix discovered by Dr. Ouwehand in Lake Toba in Sumatra.] Bull. Jard. Bot. Buitenzorg III, 1: 190–191. *Pl. 20.* 1919.—Description is given of *Coix Ouwehandii* n. sp.—*Alfred Rehder.*

6073. Koorders, S. H. **Supplement op het Eerste Overzicht der Flora van N. O. Celebes. 2. Untersuchungen über einige in den Jahren 1894–1895 von mir in N. O. Celebes gesammelten Pflanzen.** [Supplement of the first conspectus of the flora of N. E. Celebes. Pt. 2. Studies of some plants collected by myself in 1894–95 in N. E. Celebes.] Bull. Jard. Bot. Buitenzorg III, 2: 242–260. *Pl. 4–7.* 1920.—The contents of part 1 of the Supplement which appeared as a separate publication in 1918 is given. Part 2 contains the following articles: 1, a note on *Hoya maxima* (Karst.) published here as a new combination and as the type of a new subgenus *Paraconchophyllum* which also includes *H. imbricata* Callery and the new *H. pseudomaxima* from the Philippines, while the remaining species are referred to the new subgenus *Eusperlingia;* 2, a note on *Clethra canescens* Reinw.; 3, description and figure of *Elaeocarpus rhizophorus* n. sp.—*Alfred Rehder.*

6074. Miyabe, Kingo, and Yushun Kudo. **Icones of the essential forest trees of Hokkaido.** *27 × 38.5 cm.* Fasc. IV. *P. 39–48, pl. 11–13.* April, 1921; Fasc. V. *P. 49–56, pl. 14–16.* September, 1921; Fasc. VI. *P. 57–64, pl. 17–19.* November, 1921. Published by the Hokkaido Government.—These fascicles continue the work on the same plan as those previously published, and each fascicle contains descriptions and colored illustrations of 3 species. The species included, in order of their enumeration, are as follows: *Populus Maximowiczii* A. Henry, *P. Sieboldi* Miq., *Salix Urbaniana* v. Seem. var. *Schneiderii* Miyabe & Kudo nom. nov. (*S. cardiophylla* Tokubuchi, not Trautv. & Mey.), *S. jessoensis* v. Seem., *S. Caprea* L., *S. rorida* Lacks., *S. viminalis* L. var. *yezoensis* C. K. Schn., *S. sachalinensis* Fr. Schm., and *S. Miyabeana* v. Seem. [See also Bot. Absts. 10, Entry 329.]—*J. M. Greenman.*

6075. Osterhout, Geo. E. **What is Geranium caespitosum James?** Bull. Torrey Bot. Club 50: 81–84. 1923.—Evidence is presented to show that *Geranium caespitosum* James should be called *G. intermedium* James, and that *G. atropurpureum* Heller is not a synonym, but refers to a different species, while *G. Parryi* (Engelm.) Heller is a synonym of *G. intermedium.*—*P. A. Munz.*

6076. Rehder, Alfred. **Michaux's earliest note on American plants.** Jour. Arnold Arboretum 4: 1–8. 1923.—The little known note on American plants sent by A. Michaux to Lamarck and published by him in 1792 with remarks on many of the species in Journal d'Histoire Naturelle is reprinted. An attempt is made to identify the names, which are only partly supplied with descriptions, with recognized species and their nomenclatural status is discussed. Some of the names proposed are not found in Michaux's Flora and not mentioned in Index Kewensis nor in any publications on American plants. Fortunately all these names remain synonyms for various reasons and no changes in nomenclature result from their identification except a possible one in the case of Michaux's *Andromeda wilmingtonia.*—*Alfred Rehder.*

6077. Riccobono, Vincenzo. **Pilocereus Catalani Ricc., nov. spec.** Bull. R. Orto Bot. Palermo 2: 223-228. 1921.—Diagnosis and descriptive notes are given of a new *Pilocereus*, the origin of which is unknown.—*Edith K. Cash.*

6078. Sant'Antimo, Principe. **Le Palme di Villa Lucia.** [The palms of the Villa Lucia.] *8vo., 86 p., 31 pl.* Tip. Giuntina: Florence.

6079. Standley, Paul C. **New species of plants from Mexico.** Jour. Washington [D.C.] Acad. Sci. 13: 5–8. 1923.—From collections of plants made by C. Conzatti in the state of Oaxaca, Mexico, the following new species are described: *Allionia grandiflora, Caesalpinia Ortegae, Amyris Conzattii, Schaefferia oaxacana, Bouvardia oaxacana, Chomelia barbata,* and the tree previously described under the name *Pithecolobium tomentosum* Micheli, is transferred to the genus *Albizzia,* with the specific name *tomentosa.*—*Helen M. Gilkey.*

6080. Valeton, Th. **Cominsia minor Val. (Marantaceae).** Bull. Jard. Bot. Buitenzorg III, 2: 351–353. *Pl. 11.* 1920.—*Cominsia minor* a new shrubby species from southwestern New Guinea is described and figured.—*Alfred Rehder.*

6081. Valeton, Th. **Stichianthus Val. genus novum. Rubiacearum.** [**Stichianthus, a new genus of Rubiaceae.**] Bull. Jard. Bot. Buitenzorg III, 2: 349–350. *Pl. 10.* 1920.—The new genus **Stichianthus** with one species, *S. minutiflorum* [*sic*], from Borneo is described and figured.—*Alfred Rehder.*

6082. Valeton, Th. **Zwei Rhizophoraceen.** [Two Rhizophoraceae.] Bull. Jard. Bot. Buitenzorg III, 2: 346–348. *Pl. 8–9.* 1920.—The author describes and figures *Pellacalyx axillaris* Korth. with the new var. *serratifolia* and the new species *Carallia Hulstijnii.*—*Alfred Rehder.*

6083. Wilson, Ernest H. **The Rhododendrons of northeastern Asia exclusive of those belonging to the subgenus Anthodendron.** Jour. Arnold Arboretum 4: 33–56. 1923.—Eleven species are recognized in the region under consideration, belonging to the subgenera *Eurhodendron, Azalcastrum,* and *Therorhodion.* Keys to the subgenera, sections, and species are provided and of each species the complete synonymy and a description are given and the known varieties, forms, and hybrids enumerated; a new hybrid *Rhododendron Watereri* (*R. Metternichii* var. *pentamerum* × *catawbiense hybrid*) is described.—*Alfred Rehder.*

REVISIONS AND MONOGRAPHS

6084. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. VI. Part 7. *P. 341–418, pl. 232–235.* John Spence: Sydney, January, 1922.—The present part contains descriptions and illustrations of the following Australian and Tasmanian species: *Eucalyptus agglomerata* Maiden, *E. Simmondsii* n. sp., *E. sepulcralis* F.v.M., *E. torquata* Luehmann, *E. kalganensis* n. sp., *E. melanoxylon* n. sp., *E. Isingiana* n. sp., and *E. aggregata* Deane & Maiden. Under the caption of The Leaf the author continues his discussion of the leaf of *Eucalyptus,* particularly with reference to venation and oil content.—*J. M. Greenman.*

FLORISTICS AND PLANT DISTRIBUTION

6085. Ascherson, Paul, und Paul Graebner. **Synopsis der mitteleuropäischen Flora.** [**Synopsis of the flora of central Europe.**] Lieferung 91. Vol. V. *P. 465–544.* Wilhelm Engelmann: Leipzig, June 27, 1916.—The present part continues the treatment of the Caryophyllaceae and includes the genera *Moehringia* in part, *Arenaria, Holosteum,* and *Stellaria* in part.—*J. M. Greenman.*

6086. Audas, J. H. **Through the Balangum Ranges and at Rose's Gap (Grampians).** Victorian Nat. 38: 4–8, 11–16. 1921.—A description of a trip through the Balangum Ranges is given with detailed reference to the flora of the district.—*Wm. Randolph Taylor.*

6087. Audas, J. H. **Through the Murra Murra country (Western Grampians).** Victorian Nat. 37: 59–65. 1921.—A description of a trip through the Murra-Murra country is given with detailed reference to the flora of the district. Previous collectors reported 686 ferns and flowering plants, which the present writer was able to increase to 737.—*Wm. Randolph Taylor.*

6088. Babington, Charles Cardale. **Manual of British botany.** 10th ed., with amended nomenclature and an appendix, edited by A. J. Wilmott. *Small 8vo, 668 p.* Gurney & Jackson: London, 1922.

6089. Bertsch, K. **Ein Kriegsopfer unserer Flora. [A sacrifice of our flora to the war.]** Jahresh. Ver. Vaterländ. Naturk. Württemberg 77: xxvii-xxviii. 1921.—The rare *Saxifraga amphibia* formerly grew at 2 localities on the Württemberg shores of the Lake of Constance. One of the colonies was destroyed during the war by the establishment of an aeroplane station in the immediate vicinity. The distribution of the species is discussed, the idea being expressed that it represents a relic of the Ice Age.—*A. W. Evans.*

6090. Britton, C. E. **British forms of Centaurea Jacea L.** Rept. Bot. Soc. and Exchange Club British Isles 6: 163–173. 1920 [1921].

6091. Britton, N. L. **Further botanical studies in Trinidad.** Jour. New York Bot. Gard. 22: 93–102. 1921.—Field observations on the flora and vegetation of Trinidad are recorded.—*H. A. Gleason.*

6092. Broadway, W. E. **Botanical collecting in French Guiana.** Jour. New York Bot. Gard. 22: 177–183. 1921.—Field notes on the flora and vegetation near Cayenne are recorded.—*H. A. Gleason.*

6093. Brown, G. C. **Report of the distributor for 1920.** Rept. Bot. Soc. and Exchange Club British Isles 6: 209–259. 1921 [1922].—The sheets contributed by members for the 1920 distribution amounted to 4,837. Among critical genera which were well represented were *Euphrasia, Mentha, Centaurea,* and *Potamogeton. Ranunculus* and *Erophilia* received little attention.—*G. C. Druce.*

6094. Butcher, R. W. **Plant notes, etc., for 1921. [Tillaea aquatica L.]** Rept. Bot. Soc. and Exchange Club British Isles 6: 281. *1 fig.* 1921. [1922].—This was first found in Britain by the author September, 1921. It is further described by G. C. Druce [see Bot. Absts. 12, Entry 6101].—*G. C. Druce.*

6095. Cocks, R. S. **A list of the trees of Louisiana.** Jour. Arnold Arboretum 2: 204–216. 1921 [1922].—The author presents an enumeration of all the trees native in Louisiana, based upon collections made by himself during the last 15 or 16 years. Under each species and variety a short note on the habitat is given and the flowering and fruiting time recorded. Of 8 exceptionally large trees the height and girth are given.—*Alfred Rehder.*

6096. Deam, Chas. C. **Plants new to Indiana-IX.** Proc. Indiana Acad. Sci. 1920: 225–228. 1921.—Thirty-three species, distributed among 29 genera of angiosperms, are reported as new to Indiana. Locality and habitat are given for each species.—*F. C. Anderson.*

6097. Deam, Charles C. **Plants new to Indiana. X.** Proc. Indiana Acad. Sci. 1921: 101–103. 1922.—The list consists of 18 species of angiosperms distributed among 16 genera. The location and habitat are given for each species.—*F. C. Anderson.*

6098. Denslow, H. M. **Passaic County, N. J.** Torreya 23: 31–32. 1923.—Brief notes are given on species of vascular plants collected in this county in September, 1922.—*J. C. Nelson.*

6099. Druce, G. C. **Flora Zetlandica.** Rept. Bot. Soc. and Exchange Club British Isles 6: 457–546. 1921 [1922].—The author notes 428 species including adventives and about 200 varieties and forms. The total Zetland flora consists, as at present ascertained, of 446 native and 59 adventive species. Seventy others have been recorded which are mostly errors of identification. Among the plants gathered were *Tolypella nidifica*, a great extension of its known range, *Potamogeton rutilus*, and a new variety of a hybrid of *P. pectinatus*.—*G. C. Druce.*

6100. Druce, G. C. **New county and other records.** [Phanerogams of Britain.] Rept. Bot. Soc. and Exchange Club British Isles 6: 108–163. 1920 [1921]; 369–404. 1921 [1922].

6101. [Druce, G. C.] **Plant notes for 1921. Mostly new plants to the British Isles.** Rept. Bot. Soc. and Exchange Club British Isles 6: 272–273, 275–276, 281–282, 283–290, 295, 309, 311, 314–317, 321, 326. 1921 [1922].—Notes are given of the following: *Brassica gallica* (Willd.) comb. nov., *Silene italica* Pers., *Tillaea aquatica* L., *Solidago cambrica* Huds. and new varieties, *T. lingulatum* Dalst. nov. sp., *Orchis latifolia* L., *O. praetermissa* Druce, *O. maculata* L. (= *O. ericetorum* Linton), *O. maculata* L. var. *subintegriflora* Druce, *Agrostis tenuis* Sibth. (= *A. capillaris* L.) and its varieties, and *Poa trivialis* L. var *septentrionalis* nov. var.—*G. C. Druce.*

6102. Druce, G. C., and D. Lumb. **Plant notes, etc., for 1921.** [Euphrasia septentrionalis nov. sp.] Rept. Bot. Soc. and Exchange Club British Isles 6: 298–300. 1921 [1922].

6103. Gessler, Robert, und Max [Gessler]. **Beiträge zur Flora von Stuttgart.** [Contributions to the flora of Stuttgart.] Jahresh. Ver. Vaterländ. Naturk. Württemberg 77: 51–62. 1921.—The authors present the results of their exploration in the vicinity of Stuttgart, Germany, made between 1909 and 1919, their paper representing a supplement to Kirchner's Flora von Stuttgart und Umgebung, published in 1888. The species listed number 183 and include 5 fugitive garden plants and 5 indigenous species or varieties not recorded for the region by Kirchner. Under the remaining species new stations are reported, accompanied in several cases by notes on distribution. Attention is called to the extinction or increasing rarity of certain species that were formerly abundant.—*A. W. Evans.*

6104. Gleason, H. A. **Botanizing in British Guiana.** Jour. New York Bot. Gard. 22: 161–168. 1921.—The author presents a narrative of a collecting trip with notes on the flora and vegetation.—*H. A. Gleason.*

6105. Goor, E. **En Perse (fin).** [In Persia (concluded).] Bull. Soc. Centrale Forest. Belgique 1921: 89–98. 1921.—Notes, botanical and forestry, taken on a journey through Persia from October to November, 1913, are recorded.—*W. C. Lowdermilk.*

6106. Gregory, E. S. **Violet notes in 1920.** Rept. Bot. Soc. and Exchange Club British Isles 6: 174–175. 1920 [1921].

6107. Grierson, R. **Adventive plants of the Dublin area, 1921.** Rept. Bot. Soc. and Exchange Club British Isles 6: 406. 1921 [1922].

6108. Grierson, R. **Adventive plants of the Glasgow area, 1921.** Rept. Bot. Soc. and Exchange Club British Isles 6: 405. 1921 [1922].

6109. Hastings, G. T. [Rev. of: Brown, H. P. **Trees of New York, native and naturalized.** New York State Coll. Forest. Tech. Publ. 15. *401 p., 133 pl.* 1921.] Torreya 23: 35–36. 1923.—One hundred and thirty-three species of trees, of which 109 are native, are described and illustrated, with notes on distribution and uses. Three keys are furnished. No shrubs are included.—*J. C. Nelson.*

6110. Heimlich, Louis F. **Native plants of White County—III.** Proc. Indiana Acad. Sci. 1920: 219–224. 1921.—The list includes 120 species of angiosperms, 115 of herbs, and 5 of shrubs, most of which were collected in Honey Creek Township, White County, Indiana.—*F. C. Anderson.*

6111. Heimlich, Louis F. **Plants of White County—IV.** Proc. Indiana Acad. Sci. 1921: 117–119. 1922.—The article is a list of 70 species of ferns and flowering plants distributed among 53 genera.—*F. C. Anderson.*

6112. Kershaw, J. A. **Ooldea plants.** Victorian Nat. 38: 128–130. 1922.—A list is given of 42 species collected by the author near Ooldea, 350 miles west of Port Augusta.—*Wm. Randolph Taylor.*

6113. Lacaita, C. C. **Cerastium hirsutum Tenore.** Jour. Bot. 60: 56. 1922.—A record is made of the occurrence of *Cerastium hirsutum* on Monte Mai, north of Salerno.—*Adele Lewis Grant.*

6114. Little, J. E. **Notes on North Herts willows.** Jour. Bot. 60: 78–80. 1922.—The author discusses the distribution of some of the willows found in the northern part of Hertfordshire.—*Adele Lewis Grant.*

6115. Lowe, E. N. **Plants of Mississippi.** Mississippi Geol. Surv. Bull. 17. *292 p.* 1921.—A list is given of the flowering plants and ferns of Mississippi, embodying the results of collections made by members of the Geological Survey staff and others, especially Andrew Allison and Thomas L. Bailey. The list of grasses is taken from the Tracy collection in the Department of Botany of the Mississippi Agricultural and Mechanical College. Mohr's Plant Life of Alabama was used as a basis for this bulletin. While the list is not claimed to be complete, it is felt that the mass of material brought together has added some new light on plant distribution in the central Gulf region.—*J. M. Beal.*

6116. Merrill, E. D. **An enumeration of Philippine flowering plants.** Vol. I. Fasc. 1. *P. 1–128.* 1922; Fasc. 2. *P. 129–240.* 1922. (Bur. Sci. Philippine Is. Publ. 18.)—The two parts so far issued cover the Gymnospermae, and the Monocotyledonae from the Pandanaceae to Zingiberaceae (*Amomum*). An attempt is made to summarize present knowledge of the Philippine flora, by accounting for all binomials accredited to it; including all references to Philippine and essential extra-Philippine literature; giving the habitat, occurrence, altitudinal range, and the Philippine and extra-Philippine range of each species; citing specimens when necessary or expedient; and recording all available local names under each species. The work is planned for 3 volumes, to be accompanied by full indices, general introduction, and explanatory data. No new species are described, but in the adjustment of synonymy the following new combinations are made: *Pollinia contorta* (*Pogonatherum contortum* Brongn.), *P. glabrata* (Brongn.) Trin. var. *Elmeri* (*P. monantha* Nees var. *Elmeri* Hack.), *P. viminea* (*Andropogon vimineus* Trin.), *Andropogon fragilis* R. Br. var. *malayanus* (*A. fragilis* Merr., not R. Br.), *Digitaria corymbosa* (*Panicum corymbosum* Roxb.), *D. heterantha* var. *pachyrhachis* (*Panicum heteranthum* Nees & Mey. var. *pachyrhachis* Hack.), *D. sanguinalis* (Linn.) Scop. var. *australis* (? *Panicum australe* Spreng.), *Isachne depauperata* (*I. Beneckei* f. *depauperata* Hack.), *Ichnanthus vicinus* (*Panicum vicinum* F. M. Bail.), *Chamaeraphis muricata* (*Andropogon muricatus* Linn. f.), *Dinochloa luçoniae* (*Bambusa luçoniae* Munro), *Hypolytrum scirpoides* (*Albikia scirpoides* Presl), *Cyperus diffusus* Vahl var. *pubesquama* Kükenth. (*C. pubesquama* Steud.), *Pycreus unioloides* (*Cyperus unioloides* R. Br.), *Mariscus pennatus* (*Cyperus pennatus* Lam.), *Scirpus Merrillii* Kükenth. (*Schoenoplectus Merrillii* Palla), *Fimbristylis Thouarsii* (*Arthrostylis Thouarsii* Kunth), *Schoenus philippinensis* Kükenth. (*Helothrix philippinensis* Palla), *Cladium crinitum* (*Vincentia crinita* Stapf), *Calamus maximus* Blanco var. *nanga* (*C. Merrillii* var. *nanga* Becc.), *C. maximus* Blanco var. *Merrittianus* (*C. Merrittianus* Becc.), *C. usitatus* Blanco var. *major* (*C. mollis* var. *major* Becc.), *C. usitatus* Blanco var. *palawanicus* (*C. mollis* var.

palawanicus Becc.), *Orania palindan* (Blanco) Merr. var. *sibuyanensis* (*O. philippinensis* Scheff. var. *sibuyanensis* Becc.), *Monochoria vaginalis* (Burm. f.) var. *pauciflora* (*Pontederia pauciflora* Blume), *Kolowratia congesta* (*Alpinia congesta* Elm.), *Amomum dalican* (*Hornstedtia dalican* Elm.), *A. irosinensis* (*H. irosinensis* Elm.), *A. microcheila* (*H. microcheila* Ridl.), *A. philippinense* (*H. philippinensis* Ridl.), *A. pubescens* (*A. lepicarpum* var. *pubescens* Ridl.), and *A. purpureum* (*H. purpurea* Elm.). *Languas* Koenig is adopted as the proper generic name for the oriental species long placed in *Alpinia*, and 30 Philippine species are transferred from *Alpinia* to *Languas*. The genus *Garnotiella* Stapf (Gramineae) is reduced to *Asthenochloa* Büse.—*E. D. Merrill.*

6117. Metcalf, F. P. **Notes on marsh and aquatic plants of Missouri.** Jour. Washington [D. C.] Acad. Sci. **12:** 307–312. 1922.—The results, from the standpoint of distribution, of an extensive survey of the marsh and aquatic plants of Missouri, are here published. Of the 17 plants listed, the following 10 have not previously been reported from the state: *Alisma brevipes* Greene, *Hemicarpha aristulata* (Coville) Smyth, *Naias guadalupensis* (Spreng.) Morong, *Nymphoides peltatum* (S. P. Gmel.) Britten & Rendle, *Paspalum pleniplum* Nash, *Potamogeton crispus* L., *P. Friesii* Rupr., *P. heterophyllus* Schreb., *Ruppia maritima* L., *Rynchospora corniculata* (Lam.) A. Gray.—*Helen M. Gilkey.*

6118. Mills, W. H., and A. H. Evans. **Cirsium tuberosum All. in Cambridgeshire.** Jour. Bot. **60:** 21. 1922.—A new locality is given for *Cirsium tuberosum.* It was found in Cambridgeshire among rough herbage in the south of the County.—*Adele Lewis Grant.*

6119. Murr, J. **Plant notes, etc., for 1921.** [**Chenopodium album L. and its forms.**] Rept. Bot. Soc. and Exchange Club British Isles **6:** 302–306. 1921 [1922].—The new species *C. Drucei* is included.—*G. C. Druce.*

6120. Pammel, L. H. **Notes on Buckingham Lake area.** Rept. Iowa State Bd. Conservation **1919:** 52–54. 1921.—This is a discussion of the Missouri loess and the common herbaceous plants and trees associated therewith.—*L. H. Pammel.*

6121. Petch, T. **Lantana in Ceylon.** Jour. Indian Bot. **2:** 302–306. 1921.—*Lantana aculeata* L., introduced into Ceylon about 1824, has become common but is not regarded as a troublesome weed. Rather, it is to be considered as beneficial, as it rapidly invades denuded areas and prevents erosion. *Tithonia diversifolia* Gray, a composite, was introduced in 1851 as a garden plant. It has been reported to kill out *Lantana*, but "Ceylon botanists at the present time would hesitate to affirm" this. The identity of the Lantanas in Ceylon is also discussed.—*Winfield Dudgeon.*

6122. Petersen, N. F. **Flora of Nebraska. A list of the ferns, conifers and flowering plants of the state with keys for their determination.** *3rd ed., 8 vo, 220 p.* Published by the author: Lincoln, Nebraska, 1922.—The present edition follows in general the same plan as the previous editions. A number of additions and minor corrections have been made. The most noteworthy change is the extension of the volume to include the ferns and fern allies, of which 27 are recorded from Nebraska.—*J. M. Greenman.*

6123. Ridley, H. N. **The flora of Klang Gates.** Jour. Federated Malay States Mus. **10:** 247–252. 1922.—A list is recorded of 21 species found on the lofty dyke of quartzite rising to 1,400 feet named Klang Gates (because the Klang River descending from the Main Range of the Malay Peninsula, towards K. Lumpur, has cut a gateway through it). The author theorises that a xerophytic element found on the crest is the remains of an ancient xerophytic flora which at one time pervaded the whole of the Malay Peninsula. The 21 plants listed are here enumerated. Most of them are not truly xerophytic, but several are either montane or are found near the sea: *Capparis larutensis* King, *Elaeocarpus Mastersii* King, *Rhodoleia Teysmanni* Miq., *Pygeum Hookerianum* King, *Carallia euryoides* Ridl., *Baeckea frutescens* L.,

Anplectrum divaricatum Triana, *Sonerila prostrata* Ridl., *Aleisanthia rupestris* Ridl., *Embelia coriacea* Wall., *Vaccinium eburneum* Ridl., *Rhododendron longiflorum* Lindl., *Fagraea auriculata* Jack., *Didymocarpus primulinus* Ridl., *Trema angustifolium* Bl., *Ficus indica* L., *F. diversifolia* Bl., *Choriophyllum malayanum* Benth., *Eriachne pallescens* Br., *Eulalia Milisumi* Ridl., *Cibotium Barometz* Link.—*I. H. Burkill.*

6124. Ridley, Henry N. **The flora of the Malay Peninsula.** *8vo.* **Vol. I. Polypetalae.** *xxxv + 918 p., 75 fig.* L. Reeve & Co., Ltd.: London, 1922.—The territory covered by this flora is essentially that part of the Malay Peninsula between L. 1° and 7° N., including the adjacent islands, an area approximating 52,820 square miles. The author gives in the introduction pertinent information relative to climate, rainfall, geology, botanical areas of the region, a brief statement on distribution of plants, names of places, native names and uses of plants, a list of botanists and plant collectors in the Malay Peninsula, and finally references to important literature. The entire work is planned to be encompassed in 5 volumes. The 1st volume includes the families Ranunculaceae to Cornaceae, arranged essentially in the sequence of Bentham and Hooker's Genera Plantarum. The keys are clear and concise, and the bibliography and synonymy are limited. A statement concerning the habitat and geographical distribution accompanies the ample description of each species. The following apparently new species, varieties, and combinations are included: *Cyathostemma viridiflorum* Griff. var. *Scortechinii* (*C. Scortechinii* King), *Drepananthus carinatus*, *Canangium latifolium* Pierre, *Polyalthia chrysotricha*, *P. Wrayi* (*Unona Wrayi* Hemsl.), *Popowia nervosa* (*Ellipeia nervosa* Hook. f.), *P. pumila* (*E. pumila* King), *Alphonsea Maingayi* Hook. f. var. *elliptica* (*A. elliptica* Hook. f.), *Barclaya Kunstleri* (*B. Motleyana* var. *Kunstleri* King), *Capparis perakensis* (*C. pubiflora* var. *perakensis* King), *Pittosporum reticosum*, *Polygala monticola* Ridl. var. *major*, *Hydnocarpus nana* King var. *pubescens*, *Garcinia lanceolata*, *G. Curtisii*, *G. montana*, *G. Gaudichaudii* Planch. & Triana var. *minor*, *Calophyllum lanceola*, *Ternstroemia Wallichiana* (*Erythrochiton Wallichianum* Griff.), *Eurya monticola* (*E. acuminata* var. *monticola* Ridl.), *Dipterocarpus Skinneri* King var. *hirtus*, *Anisoptera laevis*, *Shorea palustris*, *S. crassifolia*, *S. laevis*, *S. globifera*, *Pachychlamys Thiseltoni* (*Shorea Thiseltoni* King), *P. Hemsleyanus* (*Balanocarpus Hemsleyanus* King), *Hopea nutans*, *H. pubescens*, *Synaptea Maingayi* (*Vatica Maingayi* Dyer), *S. Lowii* (*V. Lowii* King), *S. lancaviensis* (*V. lancaviensis* Ridl.), *S. nitens* (*V. nitens* King), *S. perakensis* (*V. perakensis* King), *S. cinerea* (*V. cinerea* King), *S. reticulata* (*V. reticulata* King), *Vatica Scortechinii* (*Retinodendron Scortechinii* King), *Balanocarpus pubescens*, *Urena lobata* L. var. *tomentosa* (*U. tomentosa* Bl.), *Bombax insularis*, *B. larutensis* (*B. insigne* var. *larutensis* Prain), *Durio macrophyllus* (*D. testitudinarum* var. *macrophylla* King), *D. pinangianus* (*D. testitudinarum* var. *pinangiana* Becc.), *Sterculia rubiginosa* Vent var. *ensifolia* (*S. ensifolia* Masters), *Erythropsis fulgens* (*Sterculia fulgens* Wall.), *Pentace hirtula*, *P. acuta*, *Trichospermum cymbiforme* Sprague, *Sloanea javanica* (*Phoenicosperma javanica* Miq.), *Elaeocarpus acmosepalus* Stapf, *E. rugosus* Roxb. var. *singaporensis*, *E. robustus* Roxb. var. *ovalis*, *E. macrocarpa*, *Brachylophon Curtisii* Oliv. var. *Hullettii* (*B. Hullettii* King), *Connaropsis simplicifolia*, *Hydrocera angustifolia* Bl. var. *latifolia* (*H. triflora* Wight & Arn.), *Evodia malayana* (*E. Roxburghiana* Hook. fil., in part), *Citrus malaccensis*, *Gomphia microphylla*, *Canarium pilosum* Benn. var. *hirtellum* (*C. hirtellum* Benn.), *Turraea breviflora*, *Megaphyllaea annulata*, *Dysoxylum cauliflorum* Hiern var. *elongatum* (*D. cuneatum* Hiern), *D. macrothyrsum* Miq. var. *microbotrys* (*D. microbotrys* King), *D. alternatum*, *Chailletia sordida* (*C. deflexifolia* var. *sordida* Hook. f.), *Gomphandra ophirensis* (*Lasianthera lanceolata* Masters, not *G. lanceolata* King), *G. lanceolata* King var. *ovalifolia*, *G. Maingayi* King var. *pubescens* (*G. puberula* Ridl.), *G. gracilis* King var. *gracillima*, *Phytocrene trichura*, **Cantleya** n. gen. doubtfully placed in Olacinaceae, *C. johorica*, *Ilex triflora* Bl. var. *longifolia*, *Lophopetalum pallidum* Lawson var. *Curtisii* (*L. Curtisii* King), *L. coriacea* (*Kokoonia coriacea* King), *L. Maingayi* (*K. Scortechinii* King), *L. littoralis* (*K. littoralis* King), *Salacia prinoides* DC. var. *macrophylla* King (*S. macrophylla* Bl.), *Zizyphus pernettyoides*, *Ventilago velutina*, *Vitis Harmandi* (*Ampelocissus Harmandi* Planch.), *Otopora Hullettii* (*Cipura Hullettii* Ridl.), *Nephelium glabrum* Noronh. var. *sufferrugineum* (*N. sufferrugineum* Radlk.), *N. laudifolium*, *N. setosum* (*Euphoria setosa* Radlk.), *Mischocarpus Lessertianus* (*Cupania*

Lessertiana Camb.), *Meliosma elegans*, *Buchanania lucida* Bl. var. *laxiflora*, *Melanorrhoea pubescens*, *Spatholobus ferrugineus* Benth. var. *sericophyllus*, *Erythrina suberosa* var. *horrida*. *E. rostrata*, *Pongamia glabra* Vent. vars. *typica* and *xerocarpa*, *Derris elegans* Benth. vars. *typica* and *vestita* Prain, *D. amoena* Benth. vars. *typica* and *Maingayana* Prain (*D. Main. gayana* Baker), *Desmodium polycarpum* DC. var. *albiflorum*, *Dialium platysepalum* Baker var, *ambiguum* (*D. ambiguum* Prain), *Polyosma laete-virens* Griff. var. *robusta*, *Corallia euryoides*, *Combretum chinense* Roxb. vars. *Porterianum* and *pubescens*, *Quisqualis densiflora* Wall. var. *parvifolia*, *Leptospermum flavescens* Sm. var. *angustifolia*, *Rhodamnia cinerea* Jack var. *caudata*, *Eugenia trunciflora* (*E. cauliflora* Ridl., not Bergius), *E. densiflora* Duthie var. *angustifolia*, *E. subrufa* King var. *robusta*, *E. alata*, *E. pseudo-subtilis* King var. *subacuminata*, *E. pallidula*, *E. verecunda* Duthie var. *major*, *E. inophylla* Roxb. var. *Bernardi* (*E. Bernardi* King), *E. Prainiana* King var. *Pearsoniana* (*E. Pearsoiana* King), *Melastoma polyanthum* Bl. var. *angustifolia*, *M. normale* Don var. *glabrescens*, *M. perakense* (*M. malabathricum* var. *perakense* King), *Oxyspora floribunda* (*Anerincleistus floribundus* King), *O. collina* (*A. collinus* Ridl.), *O. hirticalyx* (*Allomorphia hirticalyx* Ridl.), *Allomorphia exigua* Bl. var. *capillaris* (*A. capillaris* Ridl.), *Oritrephes Barnesii* (*Anerincleistus Barnesii* Ridl.), *O. grandiflora* (*A. grandiflora* Ridl.), *O. albiflora* (*A. albiflora* Ridl.), *O. Robinsonii* (*A. Robinsonii* Ridl.), **Perilimnastes** n. gen. of Melastomaceae, *P. fruticosa* (*Anerincleistus fruticosus* Ridl.), *Sonerila prostrata*, *S. picta* Korth. vars. *concolor* and *maculata* (*S. flaccida* Stapf), *Marumia nemorosa* Bl. var. *verrucosa* (*M. verrucosa* Cogn.), *Plethiandra sessiliflora* (*Medinillopsis sessiliflora* Cogn.), *Pternandra Jackiana* (*P. coerulescens* var. *Jackiana* Clarke), *P. galeata* (*Kibessia galeata* Cogn.), *P. echinata* Jack var. *bracteata*, *Memecylon tenuifolium*, *M. dichotomum* Clarke var. *eugeniiflorum* (*M. eugeniiflorum* Ridl.), *Casearia flexula* (*C. flexuosa* Ridl., not Craib), *C. Clarkei* King var. *Kunstleri* (*C. Kunstleri* King), *Trichosanthes tricuspidata* Lour. var. *penangensis*, *Begonia Hasskarli* Zoll. & Mor. var. *hirsuta*, *B. Scortechinii* King var. *Kunstleriana* (*B. Kunstleriana* King), *B. Herveyana* King var. *robusta*, *Schefflera lurida* (*Heptapleurum luridum* King), *S. tristis* (*H. triste* King), *S. elegans* (*H. elegans* Ridl.), *S. venulosa* Harms var. *Curtisii*, *S. Curtisii* (*H. Curtisii* King), *S. micrantha* (*Paratropia micrantha* Miq.), *Trevesia rufo-setosa*, *Dendropanax lancifolium* (*Arthrophyllum lancifolium* Ridl.), and *Mastixia megacarpa*.—*J. M. Greenman.*

6125. Rydberg, Per Axel. **Notes on Rosaceae-XIV.** Bull. Torrey Bot. Club **50**: 61–71. 1923.—A discussion is given of the roses of the prairies and plains of the U. S. A. with key to each group and distribution of the species, of which 25 are recognized for this area.—*P. A. Munz.*

6126. Schaffner, J. H. **Additions to the catalog of Ohio vascular plants for 1922.** Ohio Jour. Sci. **23**: 107–114. 1923.—The list of additions includes 3 pteridophytes, 2 gymnosperms, and 67 angiosperms. A corrected list of 11 Ohio species of *Equisetum* is inserted.—*H. D. Hooker, Jr.*

6127. Small, John K. **Along the Juniata River.** Jour. New York Bot. Gard. **22**: 168–171. 1921.—A record is given of field observations on the flora of the region indicated in the title.—*H. A. Gleason.*

6128. Stephenson, T., and T. A. Stephenson. **Plant notes, etc., for 1920. [Epipactis.]** Rept. Bot. Soc. and Exchange Club British Isles **6**: 44–46. 1920 [1921].—A synopsis of the British forms of *Epipactis* is given.—*G. C. Druce.*

6129. Stephenson, T., and T. A. Stephenson. **Plant notes, etc., for 1921. [Orchis purpurella Steph. and its hybrids.]** Rept. Bot. Soc. and Exchange Club British Isles **6**: 311–314. 1921 [1922].

6130. Tadgell, A. J. **A contribution to "The flora of the Victorian Alps."** Victorian Nat. **38:** 105–118. 1922.—The author adds to a previous paper by A. J. Ewart (Victorian Nat. **27:** 104–117. 1910) 83 species of native plants, with 17 varieties and 11 aliens additional. A supplementary note gives 11 natives, 2 varieties, and 26 aliens more, making a total of 476 plants recognized in the district.—*Wm. Randolph Taylor.*

6131. Yuncker, T. G. **A species of Cuscuta not hitherto reported from Indiana.** Proc. Indiana Acad. Sci. **1920:** 229. 1921.—Two localities, Vigo and Posey Counties, for *Cuscuta cuspidata* Englm. are reported for the state of Indiana. This species is typical of the prairie region of the Mississippi River westward.—*F. C. Anderson.*